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FIFTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

The fifth annual meeting of the American Gas Institute was held according to the plans originally mapped out for it, both in respect of the Institute *per se* and of those who had charge of the local arrangements, particularly those who in such arrangements were closely connected with the Consolidated Gas Company. The latter were of a certainty up in their knowing how to be arrangers of the methodical sort, and their efforts were the net result of knowing how to do the right thing at the right time. There was profuseness without prodigality, there was order without frigidity, there was attention without any seeming of espionage. Of course, if one were to seek for other reasons concerning this clever activity, rather than the bold one that it was an Institute meeting, one need not go far. The real kernel was covered with the positive knowledge that it was the "Chief's Meeting;" and everyone on the Company's staff, from President Cortelyou to "Doctor" Clarke—what a gulf there is between these two in their relation to the huge corporation's autonomy—vied to help make their well-loved veteran Chief's meeting one that might always be recurred to with the saving knowledge that each one did his part to make it a glorious "go." The weather for the night preceding (Tuesday) gave every promise of fair October skies, and these were a certainty when Wednesday morning beamed. It is true that a haze was in the atmosphere, and the murkiness thereof betokened woodland and marsh grass fires in urban spots close by, and it is also true that the theomometer was well above the 70's at one time; but the point was, to begin with, the elements were fair. The throng around headquarters (in the beautiful Hotel Astor), the night of the 18th inst. betokened that the attendance would be of the positive sort, both in respect of numbers and of representativeness. The forecast was well borne out, shortly after 10 A.M. of the 19th, when, in the beautiful assembly hall of the Engineering Societies' Building, Mr. Wm. H. Bradley, Chief of the Engineering staff of the Consolidated Gas Company, as Fifth President of the American Gas Institute, convened it in Fifth Annual Meeting. The applause, spontaneous, hearty and lengthy, which welled up from the assembly, did not disconcert him in the least; for never a more direct-spoken man led his fellows than the Chief. With time reminding us, through the glorious shock of silver and snow that crowns his well-poised head, that the years would not be stayed, old Father Time is yet far from being a conqueror. Fraught still with that peculiar tone which ever rang out when command was necessary, his voice was as of the master when his announcement of regular order of business was made. Secretary Beadle, too, came in for his share of mention and attention, and 'tis not revealing any great secret when one notes that Mr. Beadle really takes on with grace continued accession of the air ministerial. Once the call had been made, things progressed with smoothness and celerity. That the Chief was well up in the art of directing was positively shown when it is said that the order for the morning session, first day, called for the disposal of 14 separate numbers. Only two of these numbers were put over, simply because of the temporary absence of one or two of the Committeemen. The main matters considered had to do with the routine working of the Institute. The reports of Committees and other standing bodies, notably those from the Board of Directors, and the Report of the Trustees of the Gas Educational Fund, showed that the Institute was going along smoothly in every respect, and that the fund was actually not far from the point where the fact of its becoming self-sustaining was rapidly being reached—it is true that nominally the Institute and the Fund are separate, but the bond of interdependence between them is broad and strong. As these accounts will shortly be published more or less at length in the JOURNAL, it is only here necessary to say that the various committeemen evidently had been diligent in the planning of their respective tasks during the year—the net result being a decided gain in membership and in monetary way. Of course, the positive attraction to the members as to the technical work for the first day was the President's Address. It was quite unlike the usual run of its predecessor messages, since its main passages were given to considering the future of the Institute. As in his accustomed way, the President in his annual message wrote freely respecting his thought as to how its best interests could be matured and spread. And if proper attention be given to some of the main ideas advanced by Chief Bradley in the commonsense document known as his presidential message, it is positive and certain that the Institute will all the better weather the seas over which it is now sailing so blithely. It is not at all necessary to say here that the message bore every evidence of a preparation that was lengthy and of a study that was

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deep. Indeed, were one to temporarily close off his sense of sight and to forego knowledge of the familiar voice, one could readily declare that the message was the work of a well trained man of letters, or the tabulation of facts by a barrister of fame, rather than the compilings of one whose active life has been intimately bound up in the practical working out of engineering problems, the magnitude of some of which are remarkable even in this age of wonderful achievement.

The paper list was well introduced according to the placing on the programme and the numbers as listed were disposed of without haste and with due consideration. We do not here propose to criticise any of these, since they will all in due time be given to our readers; but in the instance of those considered the first day the numbers which attracted the greatest attention were those by Mr. J. Hawley Taussig, on the "Waste Heat Utilization in Water Gas Apparatus," and on "The Determination of the Calorific Value and of Operating Conditions from Analysis of Industrial Cases," by Mr. J. M. Morehead. And in the handling by the authors of these topics, at once germane and remote to each other, the opposites were again practically illustrated. Mr. Taussig, young and forceful, well up in the literature and practice of his subject made comparison with Mr. Morehead seem altogether inappropriate, nevertheless, mature and sturdy, as Mr. Morehead undoubtedly is, his younger contributor to the paper list had all the better of it in the somewhat amusing passages that were in evidence during the respective discussions. Of course, the paper on "The Public Deceived by Faulty Data and Misleading Analyses of Data," by Dr. Humphreys, was scholarly and convincing.

But, as remarked before, we will let each paper be considered by itself later on, rather than to pass judgment or criticism now while the "go" of the meeting is still over us. One fine feature of the paper presentings was the excellent way in which they were illustrated by shadowgraphing. This was particularly noticeable in the instance of the numbers submitted respectively by Mr. T. Scofield, on "The Lighting and Ventilation of Gas Appliance Display Rooms," which had to do with the Consolidated Company's complete display along this line in its now justly celebrated "City House," and in the papers that had to do with troublesome examples of main laying tasks. Those were in triplicate this year, two being from the pens of C. C. Simpson and C. C. Simpson, Jr., the other being the contribution of Mr. A. H. Strecker, Chief Engineer of the gas division of the Public Service Company, of New Jersey—unfortunately, Mr. Strecker was not in attendance personally; fortunately, however, for himself, since his absence was attributable to a relaxation period from business cares. The shadowgraph or stereopticon views certainly emphasized and made all the clearer the nature of the really wonderful work that has been and is being done along these lines. This does not look like keeping our promise not to debate upon the separate papers, so we will not go further on these lines save to say that in Mr. R. C. Congdon the Institute unearthed an Editor of the positive type. Certainly his Wrinkle Budget was a gem. Other business that was transacted consisted in an award of the Beal medal (for the best paper submitted to the 1909 meeting) to Mr. W. H. Fulweiler, for his paper on the "Physical Theory of Coal Carbonization."

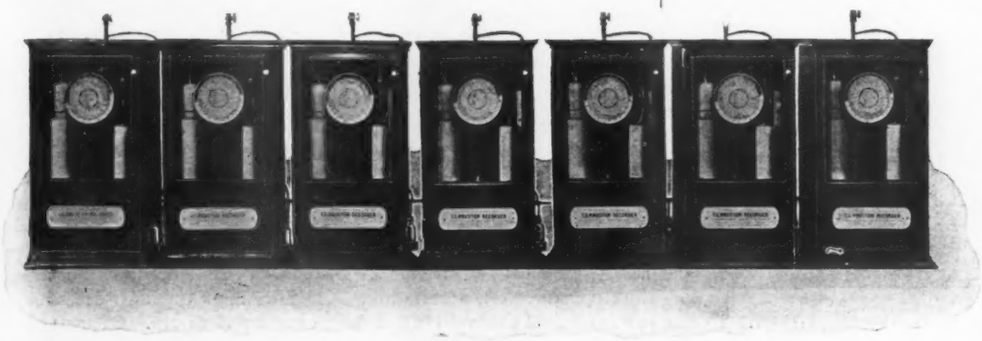
The election of officers resulted in these choices—the names were submitted by a part of the Committee only, and to say the least, they must have known why Mr. McDonald, of Louisville, was chosen to preside over the deliberations of the Institute for the ensuing year. It was thought that the underlying principle in such choices for the Institute's directing would go to men who had done good work in the field of which the Institute is the head husbandman, as a reward for their meritorious advancing of the craft. Mr. McDonald may have done this work in other circles than those which surround his home in Louisville, Ky.; but as to that we will submit that the proprietors of the Louisville Gas Company are best qualified to judge. The other officers chosen were:

First Vice-President.—Mr. W. C. Morris, New York.
Second Vice-President.—J. D. Shattuck, Chester, Pa.
Secretary and Treasurer.—A. B. Beadle, New York.
Directors, term expires 1912.—W. G. Africa, W. R. Addicks, R. C. Dawes, V. F. Dewey and J. M. Morehead.

Perhaps the President-elect himself sounded the appropriate note, when, "after the election was over," in acknowledgment of the honor put upon him, virtually said he did not know why he was elected, but that he was likely named because they felt he "was a good fellow," and the acceptance seemed to take, because it was loudly applauded. Right here, it might be noted, action was proposed for acceptance that hereafter the method of making nominations will be greatly changed. Let us hope so. The technical proceedings of the second day were marked by close attention to business, the signally noteworthy things being the paper, by Mr. W. J. Clark, of the West Chester (N. Y.) Lighting Company, on "The Cultivation of Friendly Relations between the Public and the Lighting Company." The discussion on this paper was one of the best that was ever had before any technical society. The other noteworthy extraordinary incident was a very clever invitation by Mr. J. W. Ellis, President of the Providence (R. I.) Gas Company, that the members visit the Providence plant, there to see in successful working the vertical retort system of the Didier-March type as installed by Mr. F. J. Mayer. The technical proceedings were brought to a satisfactory ending, by 5 P.M. of the second day, in the usual votes of thanks, and such testimony to thoroughness was never better earned by any who ever had the arranging and controlling of sessions of similar type. As to the social side, the programme was carried on strictly to the letter. The weather it is true was fickle, in that after the first day, neither morning, noon nor night could be depended on to keep from sprinkling or spilling. But in the end (thanks to the watchfulness of the Committeemen) all went well. The women folks were in great and stunning force, and their time between sessions and after was well occupied with automobile spins, luncheons, a trip to the Hippodrome and so on. They were not idle, in fact, they were busy. The main piece for the sterner sex (the banquet Thursday night) was all that could be asked for when congenial spirits meet. The "card" was all to the condiment, carrying at its head a portrait of the Chief, which will surely cause its keeping for a future gaze. The Grand Ballroom of the Hotel Astor was the scene of the feast, and the beautiful decorations caused some to overlook their cocktails. Every advance detail, from decoration's inspection to cigar consumption time reflected credit on the taste and finished thought of the men who made it all possible. The Chief's introduction of Past Master Toastmaster McKay was a palpable hit. Following the flashlight and the toast to the President of the United States came that to President Bradley, "that great, wise, good, serene worker," and that "jolly good fellow." The President-elect, Mr. Donald McDonald, was next honored, and his reply was built on the framework that he asked for help, not criticism, in the work he was about to attempt. Lieut.-Commander McCormick, in responding for the U. S. Navy, extended the formal invitation to visit the Brooklyn Navy Yard the following day, and the Hon. Geo. B. Cortelyou, President of the Consolidated Gas Company, commented in wise vein on the matter of some of the papers read, in so far as these touched on ideals in business and the holding of public goodwill for gas undertakings in particular, and closed by proposing a toast to the "Pioneers of the Industry." Dr. A. C. Humphreys spoke for the Gas Educational Fund in telling phrase, and Mr. T. N. McCarter, introduced as the "President of Most of New Jersey," made a neat plea for the need of tranquility and decorum in conducting their common calling. The The inimitable "Al." Eaton followed with some improvisations that he turns off so well, and it pleased all to know that he had thoroughly conquered the illness that a year or so ago sorely beset him. Our own C. H. Dickey, altogether his good self again, spoke in fraternal strain, paying in the course of his remarks a beautiful tribute to some whose voices to their ears were stilled for earthly time, having especial recourse to the memory of "Fred." R. Persons. President Wrightington, of the National Commercial Gas Association, spoke with vigor over that which was to happen at its meeting in Boston next December, and then came Mr. J. W. Leib, Jr., Vice-President of the New York Edison Company. He amusingly referred to his effort to address the members just prior to their visit to the electrical show at Madison Square Garden the previous evening. The visit, by-the-way, to this magnificent exhibition of devices slectric on Wednesday night was a treat that will long linger in the memories of those who enjoyed it. As a beautiful exhibition of the art electric it could not be excelled. Chemist Morehead here added a few paragraphs to the entertaining, which he obligingly remarked would be of the synthetical rather than the analytical order, noting as he did that the ladies and their escorts, who had just returned from their theater outing, were crowding the balcony in harmonious array. Next followed the benediction by Mr. Walter R. Addicks, Chairman (yes, the very life) of the Committee on Arrangements, who briefly outlined the programme mapped out for the morrow and bespoke for Rear Admiral Lucey, and his fellow officers, a vote of thanks for their courteous invitation to inspect Uncle Sam's huge marine harbor-haven on the Brooklyn side of the Greater City's ever turbulent East River. Nor did the ever-thoughtful, considerate gentleman (for such he surely is) neglect to note how his labors had been lightened by the efficiency of his aides and subalterns. At last the grand, old Chief voiced the good night tune, and his cheery dismissal sent the participants of the feast homeward bound, expressing the wish that their hosts could live forever in the flesh. The attendance was well up to the 400 mark, and it was not an infrequent thing to hear the wish expressed that it was not 401, the one being the only "Jim." T. Lynn. The story of to-morrow (Friday) will not have been made complete in time for any accounting this week thereof. At the time of starting, the skies are not propitious, but neither cloud nor dampness can in any sense stay the spirit of elation that prevails.—C.

A Fine Working Bank of Simmance-Abady Combustion Recorders.

We are indebted to the courtesy of Mr. M. Wolsey Campau, General Manager of the Precision Instrument Company, Detroit, Mich., for the accompanying illustration, which shows a battery of seven Simmance-Abady combustion recorders, recently shipped on single repeat order, for use in the boiler plant of a large chemical works. That works now has eleven precision recorders in its plant, including several recorders, to determine high percentages of CO_2 in lime kilns, process gas, etc.



Experience Budget, as Prepared for the Eighteenth Meeting, Pacific Coast Gas Association, by the Editor, Mr. Leon B. Jones.

To the Members of the Pacific Coast Gas Association: Gentlemen—Your Editor in charge of "Experiences" has gathered together a goodly number of them, begs to present them to you for your consideration, and to thank the members of the Association for the generous contribution of their experiences.

A Service "Check."—The local printing office, and publisher of one of the daily papers, sent in a no-gas complaint. Upon investigating, the gas at the meter inlet was good. The outlet was opened to see if the meter was stuck, but instead of finding the cause to be such, the brass check (under separate cover) was found reposing in the connection.

The Editor of the paper was consulted to determine the object of the thing. He stated that the "Gem Gas Bill Reducer" cost him $3.50, and was a protection to prevent the gas that had passed through the meter from running back to the main when gas was not in use by the house. He (the Editor) fully believed this to be a fact, and stated that the "Confidence Man" (from whom he purchased the bill-reducer) showed him testimonials from a number of publishers as to the ability of the check. The "Trouble Man" suggested to the Editor that he place a few brickbats on the meter, then tie a wet sack about it, "and maybe he would reduce the gas bill."

A Box of Gas.—Some while ago a family moved in town from a farm, where they had not been accustomed to the use of such necessities of life as gas. They were pursuaded to use gas, as connections were in the house they moved into. For the first month or so they got on very well, the quantity of gas used being about the average. However, one month the gas used did not equal the meter charges. This fact was noted by the bookkeeper, who, thinking that something might be wrong with the meter, ordered it changed. When the man reached the house with the new meter, a woman greated him with: "Well!! I thought it about time that you brought around another box of gas!"

How the Leakage of a Certain Gas Company was Reduced from 45 to 7 Per Cent. in about Half an Hour.—"Once upon a time"—so began many of the fairy stories of our infancy; but this is an account of an actual occurrence—the writer was invited to take charge of an Eastern gas works, where the alleged discrepancy between make and accounted-for gas all at once started to climb from 10 to 45 per cent., for several months sticking to the higher figures. The President of the Company was an old ex-soldier, and he threatened to do something desperate to himself unless the trouble was soon located. The Superintendent, then quite a young man, and now one of the best general managers in the business, said the President was welcome to act on his own suggestion; but, as for himself, having done all he could to find the trouble unsuccessf ully, he was willing to let someone else try his hand.

The writer, for the first month of his second incumbency of that position (for 14 years prior to the above he had been in charge of the same plant and had partly rebuilt it) let things go their natural gait, but watched all closely and found everything working well. Still, at the end of the month, the unaccounted-for gas loomed up 45 per cent. just the same. The station meter showed a certain amount of gas had passed through and had been duly recorded. Coal and water gas was being made, and, with a large stock of material on hand, for it was winter, the checking up of same was not so easy.

But if 45 per cent. of gas leaked away, an odor should have been perceptible somewhere. We had been barring the street mains for leaks, finding only a few unimportant ones which were repaired. Where could all this gas have gone? The station meter had been tested and found correct. The 3 gasholders were reasonably tight; but just at that point the writer began to suspect something. Toward the end of his first engagement with that company the manufacture of water gas had been introduced, and at a time when the relief holder was not yet known. We had only 2 holders, which were connected with a 12-inch valved main, so that No. 1 holder could be filled from holder No. 2, which was the heavier. In the following years during which the writer was at a western works, holder No. 1 was made the relief holder for the water gas apparatus, and a third storage holder added.

There were three or four changes in the superintendency also, and the connection between holders No. 1 and 2 was forgotten, or overlooked; for I had left a good ground plan of the works when going West in 1883. It occurred to me to look up that main and valve, and found it to be both accessible and surprisingly easy to operate for a valve supposed to have been so many years out of use. I jammed that valve fast with a crowbar, filled in the hole on top myself, said not a word to anybody about it, and the next month our leakage had been reduced to less than 7 per cent.

As a sequel to the preceding narrative the following may be interesting: Soon after discovering the cause of the supposed enormous leakage, and stopping same, it was found that more coal and oil were used (apparently) than either the quantity or quality of gas made warranted.

The carbonizing sheets showed the usual number of runs made, all other data as well corresponding; but while the candle power grew no better, the quantity of gas was less. So I procured a recording pressure gauge, connected it with the relief holder inlet and found the trouble inside of 24 hours. The night gas maker *did not make any gas* from about 2 until 5 A.M. This could be clearly seen beyond room for doubt upon the pressure gauge register card, which would, as you all understand, show a decided increase in pressure whenever a new run was started in the apparatus. It was a surprised gas maker when, the next morning, he was told by the writer of this undeniable dereliction of duty; and that, with the former discovery, caused the cessation of former attempts to find out if or not "the old man" knew his business, especially as it was told the working force in impressive, if unprintable language, what the consequences would be "The next time."

How a Process was Born, or "Necessity is the Mother of Invention."—In July, 1883, the writer was appointed Engineer and Superintendent of the Laclede Gas Company, St. Louis, Mo., and found the following conditions:

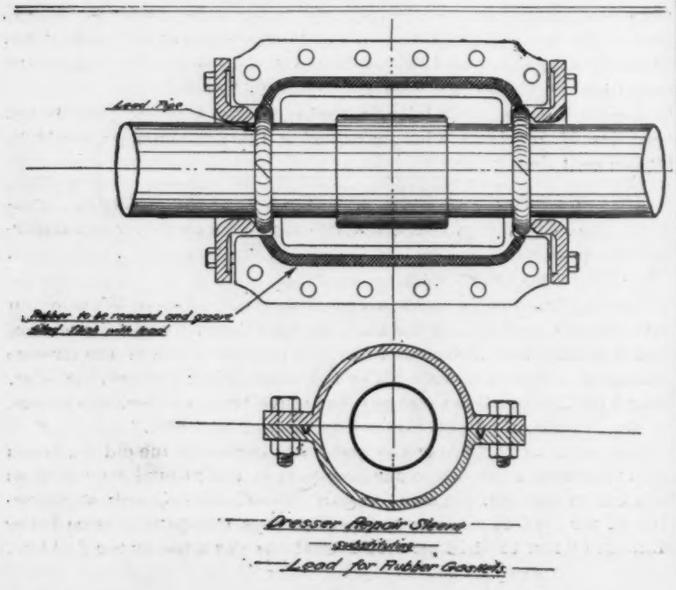
The city was divided into two gas districts. South of Washington avenue was supplied by the St. Louis Gas Company and the price of gas was $2.50 per 1,000 cubic feet. The district north of the avenue named was furnished with gas by two Companies; the first, the older, being the Laclede Gas Company, the other, or opposition, was known as the "Light, Heat and Power Company of St. Louis."

The works of the latter Company was located in the old St. Louis Gas Company's district (occupying part of the ground now used as the Union Station), but sold gas only in the Laclede's district, charging $1 per 1,000 cubic feet; the Laclede Gas Company's price being limited by law to $1.50 per 1,000. Coal gas was made by the first two.

and water gas by the last of the Companies named, which was started strictly as an opposition to the Laclede. The Light, Heat and Power Company, in canvassing for business, not only used the reduction in price as an argument, but asserted—to convince subscribers that they would not afterwards raise—that water gas was naturally just as good as coal gas, while it could be made ever so much cheaper "because it was largely made from water or steam, which cost very little." The situation was beginning to look serious to the Laclede officials when the writer was called and placed in charge by the President of the Company. Under then prevailing conditions it was seen that coal gas was by far the cheaper to produce, notwithstanding the specious logic employed by the opposition Company to get consumers, and in which they were quite successful. The water gas Company was operating the Lowe process, so we could not get license to use it. Other methods to produce water were offered, looked into and declined, because they appeared to be palpable infringements of the fundamental Lowe patents. So, then, the writer decided to invent a process which would at least enable us to also manufacture water gas—if we wanted to—and thus meet the arguments of our opponents; "Fighting the devil with fire," as it were. The method decided upon was to use a cupola somewhat like the so-called "Springer Process" apparatus, which by-the-way owed its successful operation to the remodeling by the writer, one year before at Chicago, for in its original form it was a dismal failure. Then, instead of using a blower and air pressure to bring the fuel to incandescence in the generator, we employed an exhauster *and drew* the necessary air through the fuel bed, and thus the "Suction Gas Process" was born. It is true we made only blue water gas in the generator, but we did it with a notably smaller expenditure of fuel than was done in the air blast machines. The gas was carbureted with oil gas, made by a simple but effective method in our ordinary coal gas retorts; and, after a few improvements made to the original apparatus, we found that we had a pretty good water gas process, which fully served our purpose as previously indicated. We then likewise reduced the price of gas to $1 per 1,000 cubic feet. Our canvassers could tell our patrons that we also were making water gas, which we did, too; about one-third of our make being such. We fought our opponents to a standstill in a little while.

The patents granted to the writer, bearing upon this original suction gas process, have long since expired, but it is possible that some still interesting features may be found in them, and anyone desiring copies can probably get such by sending 5 cents for each copy desired to the Commissioner of Patents, U. S. Patent Office, Washington, D. C. To get any copy wanted it is also required to mention name of inventor, subject, number and date of the patent.

Experience with High Pressure Joints.—We have considerable trouble on a 10-inch high pressure line, which is casing connected with Dresser couplings used with rubber gaskets. No cooler is used, except the storage tank, consequently the gas is sent out very hot. This heat expanded the joints to such an extent that the benzol in the gas had a chance to act on the rubbers, with a result that the rubber, after softening up, finally blew out of the joint and leaked. We had these repair sleeves on hand. They are the standard, heavy repair sleeve of the Dresser type, intended to inclose a Dresser coupling, and they are made up with rubber gaskets. As we found the rubber gaskets would not last under these conditions, we decided to try lead in place of the rubber. The rubber in the split sleeve itself was pulled out of the crevice and this run even-full with lead. We then used some standard ⅜ lead pipe, cut to lengths sufficient to make a gasket with a diagonal joint, as shown, and used these in place of the regular rubber gasket. We had no trouble in pulling up this repair sleeve complete and gas tight, and they have given us no further trouble.



A "Near" Asphyxiation.—A most unusual accident (as well as a very humorous one to all except the victim) occurred in Los Angeles a few weeks ago. While a captive balloon, inflated with ordinary illuminating gas and being operated at Eighth street and Broadway, was preparing for an ascent, one of the men in charge attempted to smooth out some wrinkles near the top of the balloon by climbing up the rigging between it and the gas bag. Just before reaching the top he stopped to rest, and in doing so allowed too much of his weight to press against the well filled bag, causing it to rip. Of course, the imprisoned gas immediately rushed out, tearing the slit larger as it issued forth. The man clung to the network of ropes like a fly to a wall until overcome by the escaping gas, when he dropped and disappeared through the hole in the balloon.

There were several eye witnesses of the accident, and it required only a few seconds to cut a hole in the bottom of the bag and allow the unfortunate victim to drop out. A cool-headed individual who happened to be near immediately secured an oxygen tank, the contents of which, together with other restoratives, were administered to the unconscious man. After about 45 minutes of strenuous work, including artificial respiration and the rolling of the victim over a barrel, he regained consciousness. He was at first somewhat delirious, but in a very short time was well and sound again and able to assist in repairing and refilling the balloon.

Centrifugal Pumps.—It may not be generally known that the head or pressure against which a centrifugal pump will work can be raised or lowered by a change in the design of the runner, with no other alteration. We recently had occasion to change a pump designed to pump against 15 pounds per square inch, to work against 40 pounds. This was done by simply changing the runner, at a small cost, and the pump is perfectly satisfactory.

Use of Dresser Couplings for Emergency Repairs.—For some time we have used "Dresser Couplings" for our high pressure gas lines about the works with great satisfaction. A while ago we had a break in a very important hot oil line, and by the use of these couplings it was put back into service in a very few minutes, whereas to install a flange coupling would have necessitated cutting several threads and consumed ½ hour or more. Now we keep all sizes of these couplings on hand for such work, and they have saved us from trouble several times. We have used them on steam, water, hot oil, compressed air, and, in fact, all kinds of connections, finding them perfectly satisfactory for emergencies. When we have the opportunity we replace them with permanent construction. We have one 4-inch coupling on a hot oil line which carries 100 pounds pressure. It has been in place 3 months and shows no sign of giving away. This is being carefully watched to see if these couplings can be used as permanent connections.

A Method of Handling Purifying Material.—The writer's experience in handling purifying material, particularly where the purifying boxes are scattered around different portions of the gas works, may be of interest. The particular experience in question was gathered while operating the gas works at St. Louis, Mo. At the various gas plants in St. Louis there were a number of sets of outdoor purifiers located at different portions of the gas works, and generally of steel cylindrical construction, more or less of the cheese-box type, these boxes being as high at the edge as 16 feet in some instances. There were openings on top of these boxes some 5 feet in diameter, also openings on the sides large enough for a man to wheel the material in with a wheelbarrow upon temporary wooden staging erected for that purpose. The largest of these boxes was 40 feet in diameter by 16 feet depth at edge, and, owing to the considerable number of these boxes and the scattered location of same, a mechanical contrivance for easily and economically putting fresh purifying material into them became a necessity as well as an interesting study. The

cost of filling these large purifiers was considerable. The plan finally adopted was to construct a simple, portable bucket elevator, made up of two iron channels long enough to reach from the ground to well above the boxes. A belt carrying the buckets ran between these channels, over proper wheels at both ends, and at the top discharged into a spout which might be turned in any desired direction.

At the bottom of the machine a simple steel framework carried an electric motor which was used to operate the bucket elevator. A small steel hopper at the bottom completed the features of this equipment. The whole contrivance was mounted on wide, flanged-iron wheels, so that 2 men could readily push it around the yard and up to any of the purifiers it was desired to fill. Electric wires with convenient sockets were installed near each set of purifiers, so that rapid connection to the motor could be made at any desired location.

The operation of the machine was very simple. The man wheeled the fresh oxide up to the hopper by means of a small plank runway and dumped same into it. The bucket-elevator hoisted the oxide and discharged it by means of the spout into the portions of the boxes. The entire outfit cost comparatively little money and effected a great saving in the cost of filling these purifiers, and, as the same was portable, it could be used almost anywhere where electric wires could be run.

It occurred to the writer that inasmuch as a great many purifiers in California are out-of-doors, owing to the wonderful climate of the Pacific Coast, that such a device might become useful to some of the members of the Pacific Coast Gas Association. In the writer's experience the machine was found equally satisfactory when used indoors, and, as it was pushed around on wheels, it was easily possible to bring it into any ordinary purifying house through a large door.

An Experience with Automobile Head Lighting with Blau Gas.—Blau gas is an ingenious result of the compression of oil gas to 1,500 pounds per square inch into a liquid form. This liquid is then expanded into gas at a pressure of 25 pounds per square inch, and then reduced to 12 inches water pressure by the use of the ordinary high pressure regulator. The writer had the privilege of being present at the first test of this new illuminant for automobile lighting. A Fiat landaulet was fitted with a small steel bottle of blau gas, containing about 2 pounds of the liquid. One pound of blau gas expands into about 12 cubic feet of the illuminating gas, and a pound of the liquid will supply a 60 candle power incandescent light for about 17 hours. The steel bottle and expansion tank occupied but small space, and were fastened to the running board in a manner similar to the prestolight. The gas was led to the headlights through small copper tubing, and was applied directly to inverted incandescent mantle lamps which had previously been used for alcohol vapor. These, although the best to be obtained, were poor expedients. The party left Long Island City, N. Y., making wide detours over the roads of Long Island to Long Beach, returning to New York City by way of the Williamsburg bridge to the Hotel Manhattan, a distance of 65 miles in 4 hours' time.

The lamps were lighted at Long Island City, and remained lighted during the entire trip, with the single interruption of a few minutes when the gas was shut off by the motion of the car shutting off the gas valve.

This trip was made over the roughest roads imaginable, and with little hope of success, but at the end of the journey the mantles were uninjured and the illumination was exceptionally good, as the blau gas heated the mantle to full incandescence, the light being entirely without shadows on account of the use of inverted mantles. This experience was novel, as it demonstrated the safety of transporting and using liquid blau gas with rough handling.

Fire Insurance and Fire Protection as Applied to the Gas and Electric Business.

[Prepared for the 18th Meeting, Pacific Coast Gas Association, by MR. R. J. CANTRELL, San Francisco.]

Why we cannot afford any more, or as well, than other lines of business, to be included among the industries throughout the United States that annually contribute to the $215,084,709, lost by fire, or an annual per capita loss of $2.51, as against 33 cents per capita loss in Europe.

Firstly.—No gas or electric company operating under the most favorable conditions, can afford to allow its properties, and especially its producing plants, to be consumed by fire.

Secondly.—We cannot afford to lose the revenue incidental to losses by fire.

Thirdly.—We cannot afford the natural criticism and loss of prestige on account of resultant poor service or the wiping out of years of labor in advertising and building up a reputation for good and continuous service.

We all know it is becoming the habit among the fire departments, and newspapers throughout the country, when a fire is discovered, and of which there is no positive proof as to the origin, to credit such fire to "crossed wires," whatever that may mean to the reporter who writes the article. It is an easy way to account for a fire, but at the same time there are so many other causes that it behooves the gas and electric companies themselves to use every precaution toward eliminating electric wire fires, not only in their own properties, but throughout the cities wherein they operate. The stigma which attaches to gas and electric companies through criticism on account of fires should not exist. It hurts us with the public, and it is an argument often used by unscrupulous salesmen for oil, gasoline and kindred appliances, wherefore, the gas and electric companies themselves should use every endeavor to remove this condition.

Following this line of thought, if a fire occurs in any city and is credited to the negligence of the gas or electric company, it is a condition over which we have very little control; but, on the other hand, if a fire occurs in the plant or on the properties of any gas or electric company, or through the carelessness of our own employees, the criticism is often more severe and our responsibility is increased many fold, for such a condition should not exist, and the causes making such a fire possible should be removed.

PRECAUTIONARY MEASURES TO BE TAKEN BY GAS AND ELECTRIC COMPANIES TO AVOID FIRES IN THEIR PROPERTIES.

Cleanliness.—Cleanliness is an element to this end, for cleanliness covers a multitude of virtues and removes a multitude of sins. In years gone by there seemed to be a prevailing sentiment that a gas works and also an electric station (in a lesser degree) should be a place for the accumulation of dirt of various degrees of blackness; that a gas maker would not be healthy or strong if not begrimed from head to foot with lampblack, coal tar, etc.; and that an operator in a station should not only be involved in a certain coating of machine grease, but should have a piece of oily waste hanging from his hip pocket, taking on the general aspect of a coal heaver—this condition going to prove conclusively, to visiting engineers and officials of the company, that such men were hard and tireless workers, as indicated by the dirt in which they have been wallowing.

These conditions, however, have changed, and there are at the present time, in certain gas works under our supervision, not to mention the electric stations, men who have proven conclusively that a gas works can be kept as clean as any other factory; and even clean, whitewashed walls are becoming common throughout our properties. Cleanliness, as above mentioned, has a wide scope and should embrace the removal of every item of refuse and unnecessary material from our plants to a safe distance. Old overalls and wearing apparel of all kinds should be discarded and removed entirely from the premises when they have served their usefulness, not hung behind doors, thrown under benches, etc.; and as oily waste is one of the most dangerous elements existing, proper cans should be provided for the caring of discarded waste and also new material.

Window Glass.—Window glass which is broken should be repaired at once, not left as an opening for live sparks and drafts to communicate fires to our buildings.

Hose Lines.—These should be installed of the best quality of rubber-lined mill hose, with suitable nozzles, and each hose lines should be kept connected at all times, not being used for any other purpose than for fire protection.

Leaky valves and the rotting off of hose lines at valve connections, which examples are of common occurrence, are avoided by installing drip-cocks between the valve and the hose connection, or by boring a ⅛-inch hole in the lowest point in the valve or in the connection, outside of the valve, so as to allow any water which may leak through the valve to drip off and not run down and enter the hose to cause it to rot.

Hose reels are becoming more or less obsolete, as instanced by their being discarded by fire departments, and in the adoption of hose wagons, from which the hose can be readily dragged. Hose houses for outside, weather-exposed places are preferable, with a shelf in such houses made of slats, the hose to be piled on the shelf. This allows the hose to be connected to the valve at all times, giving plenty

of ventilation to guard against sweating and dry rot, which can happen when a hose is wound tightly on a reel. A plain shelf inside of a building will answer the purpose of a hose receptacle better than a reel.

A common fault is the installation of hose lines of a size too large, and longer than can be properly handled by one or two men, and especially so where it is necessary to use a hose on a gallery or roof. The National Fire Protection Association will not indorse for any one man hose larger than 1½-inch, the larger size being considered too heavy for a watchman or other one man to handle.

Where city water pressure is not sufficient a pump should be tied into the water system, such pump to be installed on a line by itself, not jumbled up on different pipe lines feeding water to boilers, scrubbers or other machinery in the plant. Electric motor-driven pumps are not recommended for fire purposes, on account of the possibility of the electric current being "cut out" at the time of fire.

Ladders.—No plant should be without a ladder for free access to the roofs, and our rules provide for stationary ladders, attached to walls of buildings having wooden roofs, insuring their being there when needed, and not down in a corner of the yard under a pile of lumber.

Fire Extinguishers.—These are invaluable when properly cared for and regularly examined, cleaned and re-charged. Electric stations are best served with powder extinguishers for fires in large machinery, and sand, thrown from buckets on machinery and open switchboard work. Secondly, and in time of dire necessity after the current has been cut off, chemical extinguishers and hose lines should be brought into play. Wet generator armatures or field coils are of more value than a machine entirely burned out. Oil fires are best taken care of by sand and chemical extinguishers.

Sand Buckets.—Fiber sand buckets only should be used in electric stations; metal buckets being dangerous account of possible contact. A rule established by the Pacific Gas and Electric Company, as to the methods of caring for electric fires, calls for the use of dry powder extinguishers, first; but throw sand on open switchboard, oil and wire fires where the flames can be readily attacked, or where smothering is the main object.

Chemical extinguishers (contrary to the general ideas on this subject) can safely be used (after the current has been cut off from a motor or generator) without harmful effect to such apparatus, it being conceded that a wet machine is better than a machine entirely destroyed by fire. When a chemical extinguisher has been used on a machine, the machine or parts thus dampened should, of course, be taken out and immediately dried.

One of the most careless and wasteful expenditures of money in connection with chemical extinguishers is the purchase of same and the common practice of neglect in their up-keep and recharging at stated intervals. A system adopted by the Pacific Gas and Electric Company calls for the re-charging of all chemical extinguishers once every 6 months, and a check system against neglect so to do consists of a small metal case tacked to the wall alongside of each extinguisher, such case containing a number of cards, with a duplicate stub to each card. These cards are to be filled in every 6 months and the stub sent to the general office, showing the date of re-charging. These stubs are filed away, 6 months hence from the time of last recharge, and a new stub must be sent in each 6 months to replace the last one received. Each extinguisher is given an individual tag number. Special attention should be given to the selection of chemical fire extinguishers, there being a number on the market that must be considered dangerous from possible explosions, and others that are defective and worthless. Three-gallon chemical extinguishers are recommended; larger sizes being too heavy and unwieldy for ready use.

It seems a common error that fire fighting apparatus, especially in electric stations, should be crowed onto and behind switchboards, and in dangerous places where a fire is most likely to occur. Fire apparatus should be placed in the open, on columns in the center of the room, or on a wall well removed from the danger point; the object being to allow men to get at the apparatus easily and quickly and then fight their way to a fire, rather than go into a fire empty-handed and grope around for the fire apparatus best adapted to kill such fire.

Fire apparatus should also be installed in stipulated places, to be decided upon as a "fire station," and kept in such places in order that men may know where to find it in case of fire, and not have to look behind doors and under benches for fire appliances when urgently needed and needed at once.

Watchman's Clocks.—Where plants are sufficiently large to warrant a night watchman, watchman's clocks should be used.

Gasoline.

Gasoline assumes the elements of a paradox. To the gas and electric men, having to do with the commercial end, it is always a bugbear; a threat under which to drive a hard bargain before a contract for power or lighting can be closed, and a continual source of annoyance. To the gas men out on trouble of a certain nature it means relief, a helping hand and a freer flow of gas. To the insurance department it is a nightmare; it is on a par with the prohibitionists' "demon rum." It is a menace to property, life and limb, and its mere presence means higher rates of insurance and continuous surveillance and inspection of properties. Do not keep gasoline in your buildings; store it in the yard and only draw it in the necessary quantities desired. A book could be written on this subject and its chapters would be long and horrible.

Matches.

Safety matches only should be purchased and allowed employees.

Inspections.

Money spent in inspecting properties and caring for fire apparatus is well spent; but such inspections should be systematic, at stated intervals, not haphazard, as time flies and apparatus may be useless when urgently needed.

Why Gas and Electric Companies can Safely Carry their Own Insurance.

Gas and electric plants are almost constantly guarded, being in most cases operated continuously. A sufficient water supply can always be had and proper hose lines installed if given the necessary attention. The buildings of a gas plant are a secondary consideration, their loss by fire not necessarily meaning the shutting down of the plant. Gas plant buildings should be so erected that they will not cause unnecessary damage to the machinery in case the buildings burn.

With proper precautions there can be no excuse for fires in electric stations. Oil switches should be built outside of stations wherever possible. Electric apparatus fires are bound to occur, but can be confined, if such apparatus be installed in open places and not located adjacent to inflammable structures.

In carrying your own insurance, a sinking fund in actual cash should be created, with deposits made monthly, and the old line insurance dropped gradually, leaving the most hazardous properties until the last.

Causes of Fires in Properties of Pacific Gas and Electric Company.—1909.

Property Destroyed.	Cause.	Date.
Roof fire	Hot smokestack	2-15-09.
" "	" "	4- 7-09.
Machine shop	Sparks	5-25-09.
Sub-station	Electrical	8-22-09.
Interior of warehouse	Firepot	9-13-09.
" " sub-station	Arc	9-25-09.
Construction camp buildings	Lamp explosion	11-16-09.

1910.

Roof fire	Hot smokestack	2- 1-10.
Oil tank	Incendiary	2-28-10.
Switch house	Break down of oil switch	3- 9-10.
Roof fire	Hot smokestack	3- 9-10.
Sawmill	Presumably sparks	3-10-10.
Wall of gas building	Oil	3-10-10.
" electrical sub-station	Electric wires	3- 7-10.
Switch house	Break down of oil switch	4-24-10.
Roof fire	Break down of high tension wires	5-16-10.
Warehouse yard	Rubbish-spontaneous	5-16-10.
Packing cases and excelsior	Spontaneous	5-19-10.
Stairs in branch office	Rubbish	5-23-10.
Frame warehouse building	Unknown	6- 9-10.
Purifier house walls	Sparks	6-22-10.
Ditch-house dwelling	Rubbish	6-26-10.
Gasoline fireman burned	Matches on floor	6-21-10.
Floor slightly burned	Oil switch	7-25-10.

Gas Leakage.

[Prepared for the 18th Meeting, Pacific Coast Gas Association, by Mr. George Kirk, Oakland, Cal.]

So much has been written on the subject of gas leakage, and the ground has been so well covered, that I feel unable to do the matter further justice; but I will endeavor to call your attention to some few points I have observed during my experience of nearly 36 years at one plant, which to-day sends out 5,000,000 cubic feet per day as its minimum.

Too much care cannot be taken in installing mains, and only men who are good mechanics and thoroughly reliable should be employed on this work. They should take as much interest in their work as if

it were being done on their own private property. When I started with the Oakland Company, nearly 36 years ago, it was a small place, and at that time the largest pipe we had laid was 8-inch, with not much of that. We, like a great many small plants, had to depend on San Francisco to send men over to lay our mains, laying only one or two blocks at a time, and, as a general thing, they were not as careful as they might be, knowing that they would have no trouble in the future. As the place grew, however, and we were able to have a steady crew of men, who were responsible if anything went wrong, conditions changed and we had first-class work. Now we consider we have about as tight a system of piping in Oakland as there is in the United States.

One of the first points in stopping leakage is to furnish a man with good tools to do the work, then see he does his work right at the start. In the first place, in using yarn, my experience is that the best yarn is tarred hemp. When that is properly driven home, and about 1½ inches of lead well caulked in, the pipes are not apt to leak, providing the other mechanical principles of pipe laying are properly carried out; namely, if the pipe is properly and solidly blocked, every joint brought home iron-to-iron, and correct alignment of the pipe in the ditch properly looked after. In cases where conditions make it necessary to swing a line of cast iron pipe without using bends, care should be taken in chipping off the bead end so as to still maintain a solid joint.

I cannot emphasize too strongly the necessity for blocking pipe solidly. In digging a ditch it sometimes becomes necessary to change your grade after the ditch is finished. In all cases the blocking should rest upon the solid, undisturbed ground, not on some freshly-filled or tamped earth. There should be two blocks under each length of pipe, as near to the end as possible, without interfering with caulking.

Contraction and expansion cannot be said to have any appreciable effect upon our leakage, for in our climate the temperature below the ground, at the depth which we lay our mains, varies only in a small degree between the winter and the summer, and therefore can hardly be called a source of trouble in our leakage department. We did have one instance, however, of expansion and contraction causing leakage, which might be of interest. It was, however, an exceptional case.

A report of no gas in a certain district caused investigation of the drips in the neighborhood, which developed the fact that a drip on a 4-inch line was full of water, and the water was coming in so fast that it was necessary to station a man at the pump continuously in order to keep a section of town from going out of gas. As this was the first storm of the season I figured that that water must certainly come from the high ground where we had laid some mains during the previous summer. We followed up a 4-inch main, which for a short distance passes through a territory thinly settled, in order to reach an isolated group of consumers, and soon discovered a leak of gas. On digging up we found that a 2-inch wrought iron lateral main, which was screwed into a 4-inch plug in a tee, had pulled the plug out of the bell far enough to cause a leak all around the joint. The whole instance of the laying of this pipe was then called to mind, for it was during a spell of weather warmer than usual, and the man in charge of the work had left too much ditch open. The first rain had, of course, chilled the pipe, causing it to contract and pull out the plug, whereupon the water running into the pipe gave us immediate notice of the leak.

Concerning the matter of tapping holes. Thirty or 40 years ago they had a very crude way of tapping their pipes. In some instances they cut the hole with a diamond point, then reamed it out and tapped it. I believe some companies do it that way at the present time, but with the new tapping machine up-to-date men can do better work and save time and gas as well.

This matter of tools and general equipment for the men is one of such importance that I feel it cannot be too strongly emphasized. It is not only from the point of view of the mechanic that good tools make a good job, but it is as well a moral question with the men. If you equip a man with a good set of tools of every description, all of the latest, up-to-date improvements, including the labor-saving devices, etc., you encourage that man to do the best work possible, for every true mechanic, no matter what his line of work may be, takes a natural pride in the tools of his trade. This is especially true in street main work of the service man, who uses the largest variety of tools. I do not mean to state that a fine set of tools will make a first-class mechanic out of a careless, slovenly worker, for I have during my experience on some occasions found a line of wrought iron pipe, or a service, put together and about to be filled in, with every joint leaking. A time card is the only remedy for such cases.

I find that the heavy pressures we now carry are more liable to cause leakage than when we only carried from 3 to 4 inches water pressure. It was the practice of our Company to shut the pressure off at 10 o'clock, keep a light pressure (say 3 inches during the day), and then turn on the heavy pressure at the peak load in the evening; but now our consumption is as heavy in the day as it is at any time, owing to the quantities of gas consumed for cooking and manufacturing purposes.

In our city the last 2 or 3 years considerable leakage has been caused by contractors grading streets and plowing up our pipes, without taking proper care; but on all occasions we have endeavored to have men on the ground to see to it that the flow of gas was stopped as soon thereafter as possible. We, of course, always have men available, whose location being definitely known, can be rushed to the scene of such trouble. In our district we have a couple of men whose duty it is to make a careful inspection of all the high pressure regulators, and we have these men for this emergency work, since their regular rounds can be arranged so that they can be located at any time of the day. In any case where their work makes it necessary for them to change the regular round thereof, they notify the office at once by 'phone. This method is satisfactory in looking after emergency cases, such as small jobs done by sewer contractors or house movers. In cases, however, of big jobs of street grading, the only absolutely safe way is to have a representative of the Company on the ground all the time, following the contractor's work as long as he is doing the plowing. We have had some trouble with leakage in our high pressure system due to electrolysis, but it showed itself so rapidly when it did leak that we had very little trouble in finding and repairing the leak.

When I started with the Oakland Gas Company the price of gas was $1.50 per 1,000, and as our sendout was small, a leak was a very serious matter at that price. Let me recall a few instances of leaks that occurred in the early days, and the method we employed to find and remedy them.

The following is our experience with a high pressure line, laid over 20 years ago; and, speaking of high pressure, I think this came pretty near being the first installation in this country. This line crossed the estuary from Oakland to Alameda.

Our first installation consisted of two 2½-inch pipes, which were imbedded in the mud as far as we were able to do, without resorting to dredging. The result was not at all satisfactory, for every time a large ship passed through the drawbridge we had trouble. They had a way of dragging their anchors as they passed through the draw, to prevent hitting the sides of the bridge, and they usually missed the bridge, but very seldom missed our pipe. The result was that we were continually making repairs after they had pulled the pipes apart. This, under the best of conditions, of course, was a source of considerable leakage. To avoid this Mr. Britton had an 8-inch pipe laid from the works, around by East Oakland, and under the canal bridge at Park street, Alameda. The pipe was put down for the purpose of replacing the original one, which was smaller, and at the same time to provide a permanent crossing for the canal to prevent the trouble above referred to. We tested it with air pressure, carrying an average of 30 to 35 pounds, and haven't discovered any leakage to amount to anything for years. In carrying pipe across the creek, which is about 500 feet wide at that point, we had to sink our pipe 7 feet below the bottom of the canal, and imbed it in concrete 18 inches think. It worked satisfactorily for years, but after it had been in service for perhaps 6 years, the drip filled up so fast that we couldn't keep it pumped clear. We then made the necessary preparations for repairs, and after we had the water drained off, we dug down to the pipe to find the leak. There was about 4 feet of mud before we got at the concrete. We opened the latter in several places and found the pipe in perfect condition. The paint that we had put on before it was covered in the concrete was just the same as when we put it on. After considerable prospecting we discovered that the salt water had reached the wrought iron pipe, that we brought from the drip, through the seam in the concrete where the top and bottom of the concrete had been put together, and had eaten out the 1¼-inch drip pipe. We dug down to the drip pipe, incased the pipe in a redwood box, 12 inches diameter, filled it with concrete and covered it up. From that day to the present we haven't had any trouble. We still use the same pipe to carry from 30 to 35 pounds pressure, and it seems to be in good condition. This is an 8-inch cast iron main, with lead joints, running from the works, where we manufacture the gas,

to our holder in Alameda, which is about 7 miles distant. My first experience in leakage in Oakland was as follows: A leak had been bothering the Company for some time, and, as mentioned before, the price of gas at that time being $1.50 per 1,000, we started to find it. It had been reported for several months that there was a wooden sewer in the street, but at last I got some men and started to dig up the 3-inch main in the bed of the streetway and found the pipe broken right in two. I fixed that and the people in the neighborhood were happy.

My next experience was in the instance of a drip at Telegraph avenue and 23d street, During the winter time in wet weather we pumped it out at 6 o'clock one evening, but before 10 o'clock the entire district was out of gas by reason of more water in the drip. That bothered us for some time, but accidentally, while putting in a service at Telegraph avenue and 36th street, we found that someone, in putting in a sewer, who had punctured our pipe with the sharp point of a pick, evidently patched it up with a piece of clay and never reported it. After that was fixed we never had water in the drip at Telegraph avenue and 23d street.

Our next experience was on a Sabbath morning, when a man called up the Superintendent's house and reported a bad leak in a main He said he saw it bubbling through the earth, but wouldn't tell where it was unless the Superintendent would pay him $2.50, which he refused to do. As soon as possible the Superintendent came to my house. We hitched up a horse and buggy and drove all over the mains where we thought it might be, but failed to find any leak that day. Shortly afterward, however, while going to Alameda, on the other side of the Webster street bridge, I discovered a leak of gas. It was coming out of an old ¾-inch service that had been eaten away by the salty soil. We found later that this was the leak the man wanted $2.50 for. The highest pressure we carried on our mains was 4 inches.

Another experience was in East Oakland, where a leak was reported on 4th avenue and East 12th street, and on 3d avenue and East 11th street. The gas was coming up through the sewer pipes in such volume that the people could hardly live in the house. We investigated, spending several days trying to locate it, but couldn't find any trace of it. At length the street caved in, between the street car tracks on East 12th street, between 1st and 2d avenues, and there we found that, in filling in the sewer excavations they hadn't tamped in. The pressure of the earth on top broke a ¾-inch service pipe, and the gas escaping from that into the sewer, went on for blocks. We fixed that and afterwards had no trouble.

Still another experience was in North Oakland, where our temporary main (2 inch pipe) was laid in a street where the "fill" had been pumped out of the bay. The salt water corroded it in about 8 months.

Electrolysis was the cause of another leak in Alameda, where current coming from the street car rail had eaten out our service pipes across the track for two blocks. We renewed them and bonded the rails on both sides with heavy copper wire, and that prevented any further trouble.

In this connection I would like to emphasize the advisability of making surveys from time to time in order to detect tramp current on street mains or services and remedy the trouble before enough action has taken place to cause leakage; also, service and meter men should be instructed to report at once any evidence of electric current which they may detect in their daily work.

Relations with the Public.

[Prepared for the 18th Meeting, Pacific Coast Gas Association, by Mr. S. M. Kennedy.]

It is of only comparatively recent occurrence that the majority of public utility companies have given any attention to the subject of relations with the public, and I am compelled to admit that, if the importance of the subject had been recognized at an earlier date than it was, there would now be less absolute necessity of giving it the grave consideration it apparently deserves.

A few short years ago a gathering like the present would have deliberated almost entirely on such subjects as "The Merits of Oil *vs.* Coal for Gas Making," "High Pressure *vs.* Low Pressure Distribution," "Storage Capacity," "Service Connections," and "Meter Tests," thinking that, with these conditions satisfactory, good service would be secured. To-day we recognize that good service only begins with the proper production of the commodity. A few short years ago all the brains and ability of a company were centered in engineers and operators, who could calculate how many thousand cubic feet of gas could be made from a ton of coal or a barrel of oil, and who, at the end of the year, could explain how their calculations were so much more satisfactory than the operating facts developed. At that time the public was not given the attention it receives to-day. Cheap clerks and green boys could sell, bill and collect for something which everybody wanted and which could be procured from only one source in a community.

Notwithstanding the deliberations and discussions of the engineers, the service was not always perfect, and history states that complaints were frequently made, but not as frequently given the needed attention. But, note the change to-day. The presidents and directors of public utility companies are very much on the alert and anxious to secure men who are able to meet and deal with customers in a manner that will give the customers satisfaction and reflect credit on the company. It has been said that the commercial engineer who can develop the business and please the public is much harder to obtain than the engineer who can operate a plant or lay out a distributing system.

No one can deny that prejudice against corporations exists in the minds of many people throughout the country. Let us try to analyze how much of this prejudice has reasonable cause for existence and how much of it may be classed as traditional. To a certain extent the antipathy of part of the public is founded on hearsay and not always supported by facts. It has been said "The evil that men do lives after them," and I have in mind the name of one man who put a stigma on public utility corporations which seems to hurt their standing in the public mind as much to-day as it did a quarter of a century ago when the crime was committed. He was a gruff man, with a big head, cold looking eyes and a frowning face, devoid of one trace of magnetism. He was a conspicuous figure in the financial world and the president of a great railroad corporation. I do not recall the circumstances surrounding the unfortunate utterance, nor do I know whether or not he had any justification for using the words, but he is credited with having coined the expression "The public be damned." The public loudly resented it then, and the public has since been unmistakably suspicious of corporations and is ever ready to pounce on corporation words or actions which may have a "public be damned" look about them. Should the public be inclined to forget the words there are those who will not let them do so. The objectionable sentence is the cheap phrase used as a headline in the yellow journal, the startling utterance of the professional agitator, the slogan of the self-appointed reform politician, and the squirming wail of the unreasonable customer.

Not long ago a company with a reputation for progressiveness made a voluntary cut in its rate and also put into effect some modifications in service regulations. A certain councilman in the benefited city, in an effort to minimize the value of the concessions, made a public utterance to the effect that the Great Northern Gas Company had changed from a "public be damned" corporation to a charitable institution. Experience shows, however, that the majority of councilmen have much more amiable dispositions than the one to whom I have referred.

You and I have had to work hard to combat the difficulties forced upon us by the wrongs committed, and the legacies left by others who were in the business before us; but, gentlemen, how often has the decent newspaper had to acknowledge that a company did not do the right thing when it had a chance? How often has the fair-minded business man blushed when he tried to defend the action of some corporation? How often has the cheap politician had good cause for his tirade against monopolies; and how often has the complaint of the reasonable man been met with scornful indifference? These conditions have existed in the past; yes, and maybe they too frequently exist to day. Prejudice against corporations is not likely to be entirely removed, because some varieties of the human family can never be satisfied. However, it is undoubtedly true that this antipathy can be greatly lessened by careful conduct on the part of the corporations, and the timely education of the public, as to the real facts surrounding the production and sale of the utilities handled. All reasonable people are willing that a company giving good service should receive fair profits. However, in a reasonable manner they must be shown just what rates are fair for the service given.

The one thing which is so frequently overlooked in connection with the gas business is that it is an intangible commodity. The purchaser does not see what he is buying, as is the case with ordinary merchandise. He cannot tell by his bill that he is paying only for what he receives. His senses, which are useful in buying other things, do not help him with his gas purchases. The only sense which some-

times comes into use is that of smell, and if he were to rely on that he would often think he were getting 10 times as much as his bill called for. Now, under conditions like these, we must rely on something to take the place of the senses, and the only substitute is represented by the word confidence. It will be through our relations with the public that this confidence will be established on firm ground, or wrecked in the quicksands of indifference.

Let us now consider what are the principal means or opportunities which we have for friendly relations with the public. It seems to me they are four in number: (1) the Press; (2) personal interviews; (3) letter writing; and (4) the telephone.

The public utility corporation needs the columns of fair newspapers to help in educating its customers and the public generally as to the best uses of the commodity handled, and to counteract the effects of inaccurate and sometimes intentionally misleading information, which emanates from misinformed, unreliable or prejudiced sources, and which, in the absence of other information, is accepted as correct. Good advertising is as useful to the gas company as it is to the department store. If you feel that your customers are not using as many thousand cubic feet as they should, show them by newspaper advertising how they can with advantage to themselves use more. If the public has wrong ideas as to your business and its operation, use the reasonably disposed newspapers to put it right. You have no more important duty to your own interests than that of educating the public to a proper appreciation of existing facts, after you are sure they are what they ought to be. All publicity of misinformation should be counteracted by even greater publicity of the true conditions. The public talks of your enormous income, tell them about enormous expenses. Much is said about your tremendous profits; tell them about the great repair and maintenance bills you are called upon to pay; tell them about the depreciation bill which is running up against you day and night, and tell them about the small rate of interest earned on the capital invested. Tell the public what you are really doing for them. Show them how constant and ready are your services. The consumer turns a valve in any part of his house; instantly the service is at his command. Does the grocer, butcher or baker serve him as quickly? Are the street car, or the telephone, or the telegraph companies at his command as readily? Let them know these and other advantages they possess through your agency. Tell of your difficulties, your successes and your plans for the future. Do not permit the impression to be created, through carelessness or lack of frankness, that the aim of the company is to take money irrespective of public obligations. You will have to be candid. You will require to be frank with them before you will have their confidence.

On the other hand, a lack of a reasonable measure of publicity is likely to be regarded as evidence of conditions which you desire to conceal, for fear the knowledge of which would tend to create an unfavorable impression.

Let us now consider the subject of personal interviews. Yours may be a great company; having abundant capital and many influential stockholders. Your President and Directors may be excellent men, with high standing in the community, but the truth is they are probably known to only a few of your customers. Now, the public does not judge a company by its officers and directors, but by such employees as clerks, collectors, solicitors, meter readers, troublemen and others with whom business brings them into contact. These are the men who see the customers in your office, or meet them in their homes or places of business, who represent the company in its intercourse with the public, and it is by the words and actions of such men that the public praises or condemns your company. Each man connected with your organization can do something each day to help your company's standing in the public mind. But one man's lapse into careless inattention, or lack of tact, may undo in a minute all the good which you may have built up to your credit in a month. Clerks in the office, and employees working on the outside, do not fully realize their importance in connection with the success of the company's business. Sometimes those a little higher up than the employees mentioned overestimate their importance, and do as much harm as those below them. An authority on the subject recently stated that, "at least 75 per cent. of public ill feeling against public service organizations has been failure of operating companies to take pains to please their customers." If such is the case, consider how important it is that each man should be informed as to what depends upon him, and have him realize that by *his* words and works the company is being judged. You may issue instructions time-and-again as to the deportment of your men. You may print books of rules and regulations and distribute them throughout your different departments; but, unaided, they won't obtain the desired results. Your men must also be taken into your confidence. The heads of departments must know the company's policy and wishes, and must impart them personally to the men under them, and again and again, at every opportunity, by word and action show how the public must be treated.

It is a fact much to be regretted that, as a rule, there is not the right sympathy between the public and the gas company. Why does this condition exist? Is it because they do not understand each other? Well; why don't they? Because the company is largely at fault? True, the intention of your directorate may be perfect; but a certain undesirable place is reported to be paved with those things. Intentions must be followed by instructions, and instructions must be carried out by individual employees. It may be true that your business is the only one of its kind in your community, and that the public must come to you if it wants service. Did you ever stop long enough to consider that that very reason does not make the public less critical? If your customers are treated with consideration, it is particularly pleasing to them, but if with discourtesy, it rankles through and through, because, having no recourse, they must continue doing business with you. Customers will ask questions about what they do not know. Employees may be asked the same question 50 times a day, by 50 different people. But what of it? They all want the information, and, if answered politely, will usually be satisfied. Each man representing a point of contact, who meets the public personally, should be selected and fitted for his position. At your plant you use great care in the construction of your machinery. You would not think of putting a ½ inch rivet into an inch hole and expect it to work satisfactorily. You would not permit a rough surface to remain on a valve which you must handle constantly. Well, keep your eye on your office and use the same amount of sense. Don't expect an inexperienced boy to handle your complaints satisfactorily. Get more mature men. They will handle the public better, and the public likes to talk to them. Look out for the men with the rough surfaces; the men who prefer to argue and not explain. They may win many arguments, but they lose many friends for your company. While your mind is on your office force, take a look at the office itself. That high railing and grillwork are not necessary, and obstructs the view. Take them down. Those little windows through which your clerks talk have a stand-off appearance; abolish them. Let the public see into your office and learn what your men look like. Let your men have a chance to mentally put themselves in the customers' place. Perhaps it will help them to understand each other better.

Letter writing is of great importance in connection with the relations of the larger companies with their customers. Many complaints are forwarded in letters, many inquiries are received and requests made. We all know that a letter itself is only cold type and thin paper. The gesture, the facial expression, the twinkle of the eye and the nod of the head, are all absent. Just the words are there to do the talking. Consequently we must be more careful. After what we have dictated has been forgotten, the letter remains in the other fellow's possession, and he may take it up now and again to look at it. If it contained anything that hurt when received it probably hurts more each time it is read, and likely the reader is loading a gun for someone. A hot letter sent in reply to a caustic letter received is poor business. Your letter may be really smart and burn with righteous indignation; but what good does it do your company? Suppose your customer had some grievance, real or imaginary, he had better be conciliated. If not, he will become more angry and talk against you and take his business somewhere else at first opportunity. Your company's letters to customers should be handled by experienced employees.

Have you ever recognized how much of your particular business is handled over the telephone and with what rapidity the number of telephone calls increase? This point of contact bids fair to one day become the most important of all. Perhaps even to-day the telephone is the door through which most of your patrons enter. Better be sure it is well oiled and well attended. You probably have a private exchange. Does your operator answer pleasantly with the company name and connect at once with the person and department wanted? Do you know that, when the department answers, as well as when the operator answers, the response is clear and courteous? Someone responsible in your office should see that employees handle all telephone calls with the same degree of care as they do when attending to patrons who make personal calls at your office. The telephone is a great factor in your business and should be developed with the care

and attention its importance merits. Insist on telephone calls being answered promptly and pleasantly. Experience has shown that over the telephone, as no where else, pleasant tones and courteous language are required. One must make his impression entirely through what he says and the way he says it. The telephone of some companies is frequently a liability, but it can, and should always be, made a valuable asset.

In all of a public utility company's relations with the public the attribute of tactful courtesy should be paramount. This quality attracts the new customers you are looking for and makes the older ones feel at ease and satisfied. It is in fact the open sesame to the public goodwill. It must now be acknowledged that a company cannot long be successfully operated without the goodwill of the public. No company can afford to assume an independent attitude. No matter how big the corporation it is vulnerable; its very greatness sometimes making it a bigger and better target. And, as for independence, the man who runs a peanut cart and has only a $5 capital investment in his business, is 1,000 times more independent than the corporation with its millions. This goodwill we want does not come by saying one thing and doing another. It comes by doing the right thing—the square thing—all the time; by giving care to what is promised and by keeping the promises made. This real courtesy we are talking about does not mean palaver, bowing and scraping, but common, ordinary, everyday politeness. It does not mean toadying to customers, whether they are big or little, but the giving to all a cheerful attention. It is the kind that gives and wins a smile, the kind that does not forget to say "thank you" when the opportunity occurs. This sort of courtesy is a fine art, and is as necessary to the healthy growth of your business as is the sunshine to the flowers.

The larger a corporation becomes the greater the tendency to drift farther and farther away from individual consumers. Instead of speaking of "our customers," we speak and think of the public. Now, that is just the condition that our customers do not like. They object to being herded and desire their individuality to be recognized. The representatives of a corporation in any city should be men who are identified with the city's interests, interests in public matters, be connected with civic and commercial bodies and known to be working for the upbuilding of the municipality. A line-up with commercial clubs, boards of trade and similar broad gauge civic bodies will eventually be more profitable than patronizing politeness and wasting time attempting to manipulate political machinery.

Let us encourage our men to know and remember our customers by name. They are human and like it. Of course, each man cannot remember all of the company's customers, but each man does not come in contact with all. It is those he constantly meets that the employee should be expected to know. One of the best ways to know a customer is when he comes with a complaint. If a man has a complaint rankling in his breast, the only thing to do is to get it out. Troubles and complaints are opportunities to make friends, and friends made this way are good workers for you and your business.

Much is said these days regarding the "Public Policy" of companies such as are represented here, and almost every gas and electric association in the United States has a standing committee that brings in regular reports on the subject. Now, there are two definitions to this word policy: First, a system or method for the administration of the affairs of a government or of any institution; second, management or administration based on temporal or material interest, rather than on principles of equity—hence, worldy wisdom, cunning, stratagem. It will be remembered that I am not now speaking for any company or organization, but for myself alone. Consequently, I am free to state that there are times when I have seen or heard of the word policy being used in the latter sense that I have been tempted to exclaim "Policy be damned." Away back some years ago, when I was learning to write, I spent hours copying a headline which read "Honesty is the best policy." I have learned since those days that it is a good thing to be honest; and, if one has no other reason for his honesty, let him be so as a policy. But, all the same, it is a mighty poor reason.

Maybe we consider policy too much in our relations with the public. When I borrow my neighbor's lawn mower, and he gets the loan of my wheelbarrow, we don't think of the question of policy. We are neighborly, and that's all there is to it. When I want to buy a cigar, or a necktie, or a pair of shoes, I don't consider the question of policy—I just drop into some store I know and select what I want. I probably know that the man keeps the desirable kind of goods, that his prices are right, and that he and his assistants are courteous, and have a smile or a word of recognition when they see me. In personal matters, I may sometimes think of reciprocity, but not of policy. Our customers should realize that after all a corporation is only an aggregation of individuals. I recognize that some things must be done for politic reasons, but why should a corporation eternally require to study policy? Why not the man-to-man idea, instead of "the corporation and the public" attitude? Why not have customers go to your office to do business, feeling that they like to do business with you? Why not cut out the word policy in the sense it is usually accepted by corporations, and let your patrons understand that the only policy you know in connection with your company is "The public be pleased." That policy does not mean giving way to all demands. It does not necessitate loss of dignity, self-respect, or income; but, on the contrary, when faithfully carried out, it represents the easy, safe and profitable way of doing business. With a "Public be pleased" policy, your difficulties will decrease in proportion with the length of time it is in effect, and the subject of "Relations with the public" will gradually be changed from a vexed problem to a condition closely resembling that of pleasure.

The Oil Situation from a Gas Man's Viewpoint.

[A paper prepared for the 18th Annual Meeting, Pacific Coast Gas Association, by MR. H. W. BURKHART, Supt. Gas Division, Southern California Edison Company, Los Angeles.]

The existence of alphaltum and semi-solid bitumen has been known in Santa Barbara county since 1792, but no attempt at development was made until about 75 years thereafter. The first well for crude oil, the "Pico well," was drilled, in 1867, near Newhall, Los Angeles county. In 1872 sufficient oil was struck in Ventura county to justify the erection of a refinery and the piping of the oil to the Coast for shipment to San Francisco. The occurrence of oil in Ventura county lead several individuals to form oil companies with the intention to drill for crude petroleum. In the city of Los Angeles the first successful well was drilled in 1892, and within next few years over 700 wells were drilled. To-day the city of Los Angeles harbors 450 producing wells, with a production of 428,000 barrels for 1909.

Los Angeles county comprises 5 distinct fields: Los Angeles City, Whittier, Fullerton, Puente and Newhall, with probably another one to be deve'oped in the Santa Monica mountains.

The Los Angeles City field includes Sherman and Salt Lake. The entire field extends toward the Coast and will be a large factor in the oil market for many years to come.

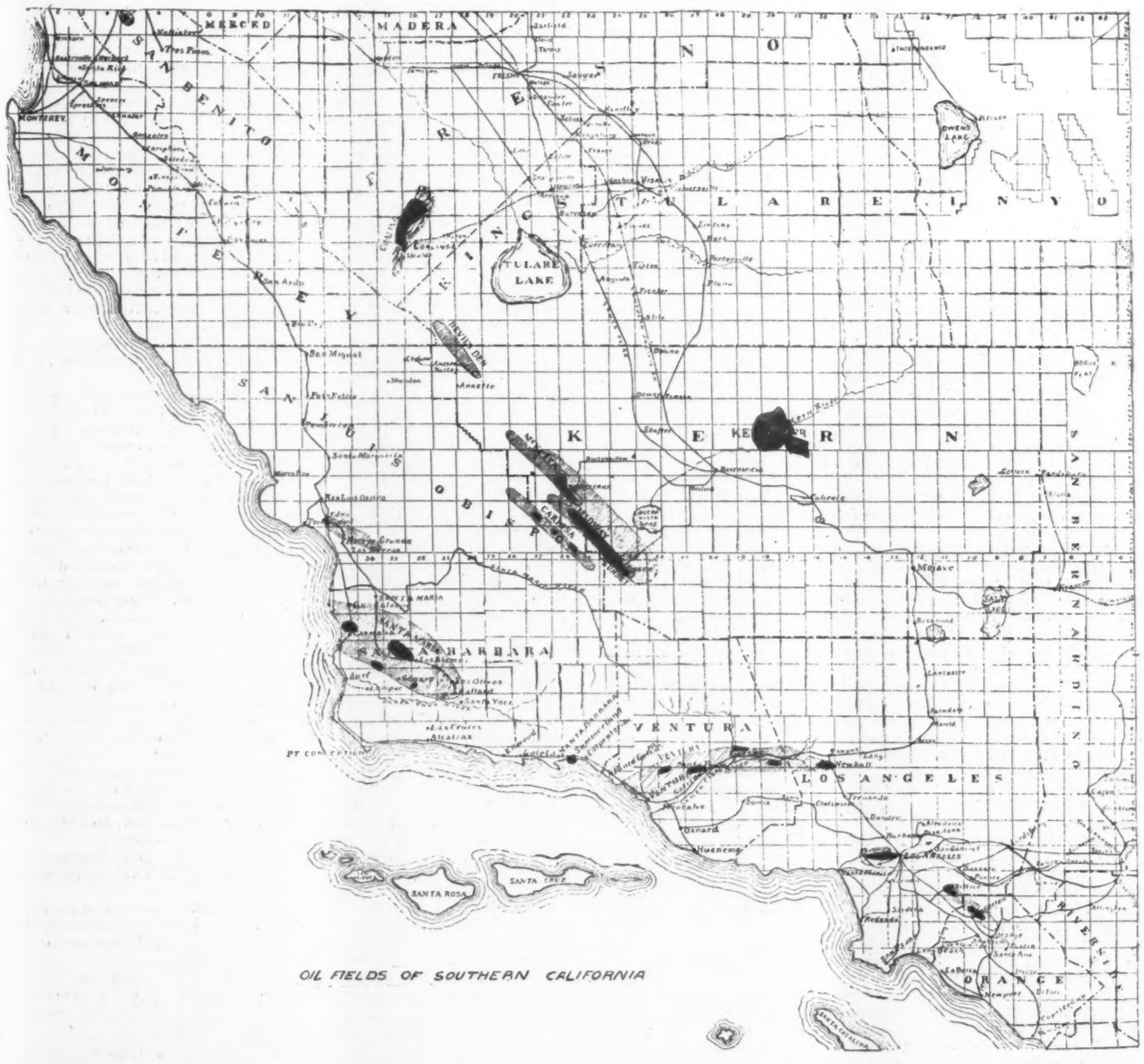
The Whittier field was one of the latest to be developed in Los Angeles county and is probably not yet fully developed. The wells vary from about 1,000 feet to about 4,000, perhaps 2,200 feet would be a fair average. As the quality of the oil is very good, the oil is sought after by refiners and gas works. Much of the product is piped to Los Nietos, on the Santa Fe Railroad, and is there loaded into cars for shipment, but practically the entire field lies 700 to 900 feet above the harbor of San Pedro, 18 miles away, thus affording an easy and cheap means of transportation to ship side.

The Santa Fe Railway, associated with others, started work in Fullerton, in 1895, and within a short time oil was found in large quantities. Wells in the territory of Fullerton run from 2,000 to 4,000 feet in depth. Work is still going on in the field and the output is being increased yearly. The Santa Fe Railway and the Hall Company practically control the output of the entire field.

The Puente Oil Company has drilled a large number of wells, most of which have been good producers. The field is still being extended, although there have been some dry holes and quite a number of the wells on the edge of the field have ceased to yield a remunerative amount. Most of the oil produced in the Puente field goes to the refinery at Chino, to which place there is a 6-inch pipe line.

Newhall field produces a very high grade oil and most of the product goes to the Standard Oil Company, being piped to Ventura and from there shipped by steamer to the refinery at Point Richmond.

In Ventura county there has been a steady production of oil for about 36 years, and, from present indications, the already large number of wells will be doubled within the next 10 years. There have been drilled in Ventura county not less than 500 wells, and it is estimated that, of the entire amount, more than ¼ are now producing. There are various reasons why the others of the wells are non-producers. Some few were dry holes in the first place, while others were not drilled deep enough; in many cases tools were lost in the wells, and a few had become exhausted. The oil-bearing sands are found at various depths in the different localities. There is generally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Madera
Chowchilla
Merced
Los Banos
Gustine
Newman
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Mountain View
Santa Clara
San Jose
Gilroy
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San Juan
Salinas
Monterey
Watsonville
Santa Cruz
Capitola
Soquel
Aptos
Felton
Boulder Creek
Big Trees
Los Gatos
Saratoga
Cupertino
Sunnyvale
Mayfield
Menlo Park
San Mateo
Burlingame
San Bruno
South San Francisco
Colma
Daly City
San Francisco
Sausalito
San Rafael
Petaluma
Santa Rosa
Healdsburg
Cloverdale
Ukiah
Willits
Fort Bragg
Mendocino
Point Arena
Gualala
Bodega
Tomales
Point Reyes
Inverness
Olema
Fairfax
San Anselmo
Ross
Kentfield
Mill Valley
Sausalito
Tiburon
Belvedere
Corte Madera
Larkspur
Novato
Petaluma
Sebastopol
Guerneville
Monte Rio
Duncans Mills
Jenner
Fort Ross
Bodega Bay
Valley Ford
Tomales
Dillon Beach
Point Reyes Station
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Muir Woods
Mill Valley
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San Rafael
Novato
Petaluma
Sebastopol
Santa Rosa
Windsor

The development of the field has been rapid, considering the difficulties encountered in drilling, and there are now something like 170 completed wells with a production of about 11,000,000 barrels per year, and the field is being constantly enlarged by the discovery of new wells, both to the south and east.

About 350 wells have been drilled belonging to some 40 companies. There never was a time when the production of the field averaged 10 barrels per well. The greatest amount produced in any one year was 208,370 barrels, in 1899, since which time the production has been gradually decreased, until at the present time it is not in excess of 65,000 barrels per year.

The California Liquid Asphalt Company had a refinery at Summerland. The production of the field, however, has fallen so low that the refinery was moved to another field.

By many geologists it is thought that there is another and more productive sand underlying the Summerland field, but so far no deep drilling has been carried on. South from Summerland lies Carpinteria. Several wells, at least one of which has attained a depth of over 3,000 feet, have been sunk on the low lands near Carpinteria. Oil was found in all of them, but in none in commercial quantities. The gravity of the oil from the Summerland field runs from 13° to 16.5° B., though the gravity of the oil is generally decreasing as the wells produce more and more water.

The Coalinga field is bearing oil at depths varying from 700 to 3,600 feet. The productive area does not cover much more than 100 acres, and the most determined efforts have so far failed to extend the field. The oil runs in specific gravity as high as 0.844, and is of a yellowish-green fluorescence.

Coalinga has already produced over 50,000,000 barrels of crude oil, and, according to the report of the United States Geological Survey, there are approximately 3,000,000,000 barrels of oil in already proven area. At the present rate of production of about 1,000,000 barrels per month, it would take 300 years to exhaust this vast supply; but the present rate will be rapidly increased within the next 10 years to such an extent that it is more than likely that, by 1920, the Coalinga field will be producing at least double what it is now. It is, of course, very unlikely that anything like 3,000,000,000 barrels will be produced from this field, but it is certain that the field will produce large quantities of oil for many years to come. Transportation facilities consist of pipe lines to Monterey, Point Richmond and Port Costa.

Oil has been known to exist in Kern county since 1870, but no very extensive developments were attempted until after the first development of the Coalinga field, although some work had been done both at McKittrick and Sunset previous to that date. Along the western edge of the county and on its line, at Devil's Den, much work has been going on for several years past and oil has been found in paying quantities. The extent of these fields is not yet known, but it is very likely there will be developed large tracts of good oil land at some of these places. Devil's Den district is somewhat isolated, and the difficulties encountered in getting in supplies and fuel have hampered developments. The Kern River field is about 4 miles across and nearly 6 miles long, and has produced almost 130,000,000 barrels of crude oil. While the field produced 14,508,000 barrels of oil in 1909, it is not likely that this amount will ever be reached again. Owing to continued low prices, many wells and a few whole leases had been closed down, waiting for better prices. Kern river is in no sense exhausted, but it is likely that there will be a gradual decline in production. Probably the field will never produce more oil in the future than it has in the past, and it is likely that another 10 years will have seen the production brought down to a nominal amount. The depth of the wells varies from about 300 feet, for the small producers of heavy oil near the break, to about 1,500 feet for those back on the hill. The total number of producing wells is about 1,410, and the field is gradually extending further north.

The Midway field, known to exist for some years, never marketed any oil until within the last 3 years, except a small quantity from the extreme south and where this field joins Sunset, of which field it is really a continuation.

The proven wells of the Midway field proper cover a total length of 12 miles, and while the width is by no means proven, there is every reason to believe that the field is at least wider than McKittrick. The latter was originally known as Asphalto, but the asphaltum industry did not prove profitable owing to excessive cost of production and transportation. Very little oil development was done at that time, though several wells were sunk which yielded a few barrels daily. When the slump in oil came, the McKittrick field was practically closed down for over a year, and for nearly 4 years very little new work was done. After the better times came, McKittrick got its revival, and to-day there are over 140 producing wells, with an average monthly production of over 450,000 barrels. The field is being rapidly extended to the north, south and east. Transportation facilities consist of the Southern Pacific Railway and the Standard Pipe Line.

Sunset is the oldest field in Kern county and had, until 1908, been almost wholly neglected. The principal cause of the delay in the development of this field was the lack of transportation facilities and the heavy gravity of the oil.

The railway facilities have been increased, and the field is reached by the Standard Pipe Line. During the last 25 years many wells were put down and most of them produced oil of a heavy gravity. There were no railroads, and as the heavy oil could not be piped, it was finally decided to build a refinery on the ground and turn the heavy oil into refined asphaltum, the product being hauled to Bakersfield by wagons.

On March 15th, 1910, the world's greatest gusher, the Lakeview, was struck with an output of 50,000 barrels per day, the oil being of a good quality and of 20° B. It seems reasonable, from the work already done, that the deeper the wells will be the lighter the oil and the heavier the flow. In the southern portion of the Sunset field are several wells producing a light oil of good quality; but the output is rather small.

The drilling for oil north of San Francisco, in Humboldt and Contra Costa counties and at Half Moon bay, does not seem to be successful in spite of the considerable work done. The districts of Del Mar, Marena and Otay, San Diego county, have indications of petroleum, and development operations are unusually active at the present time. It is a fact that the products of eastern fields have long since reached their maximum and are becoming rapidly exhausted. The Texas field has much territory yet to drill that will result in large productions, but there the wells show an enormous gas pressure which generally results in short lived wells where the gas is allowed to escape.

It is quite possible that more fields will be opened up in Colorado, although that State has reached its maximum production in the discovered fields. Wyoming will produce some oil. Utah already has a little oil, and very good prospects remain.

Numerous seepages occur in Alaska, and several attempts have been made to drill wells, but so far without success. There is great difficulty in getting in material and in the actual drilling, owing to the fact that the entire surface of the country is covered with a depost of "sea mud," some hundreds of feet thick, and it is almost impossible to force casing through this formation. It is not likely that the field, if there is one, will be developed for many years to come.

There can be no question that Mexico soon will produce enormous quantities of crude oil. If this field is a continuation of the Texas field or Coastal Plain field, it seems reasonable to expect that the life of those fields may be taken as an example of the probable duration of this one. The Texas fields have, to a large extent, been ruined by careless drilling, and the total productton of that State has fallen off and is still falling off with great rapidity. This also is true of the Southern Louisiana field, so that these fields need not be reckoned with as likely to ever increase in production. The oil fields of old Mexico are situated along the eastern shore from Tampico south nearly to Yucatan. A few seepages are along the western coast of lower California, and one instance of crude oil seeping is near the City of Mexico. Most of the new fields are located in the State of Vera Cruz and are conveniently reached by boat from Tampico, being about 70 miles up the river from the latter port.

In Mexico nearly all the proven or partly proven land is owned by a few large companies, and this fact alone will certainly not hasten development; so it is more than likely that before the product of the Mexican fields becomes a factor in the world's market, the output of other fields will be decreased in a corresponding amount.

The Mexican Petroleum Company has a pipe line to Tampico and another to the City of Mexico. The railroads of Mexico are rapidly adopting oil for fuel.

Very likely the British government will obtain most of their naval supply there in the future, as the Mexican fields will undoubtedly, when fully developed, produce an enormous quantity of oil, which will be shipped from Tampico and Vera Cruz.

It is probable that Mexico will not export any crude oil to California before the opening of the Panama Canal. All the producing wells are located in the eastern part of Mexico, and the few seepages occurring on the western coast have not yet been drilled for oil.

Chemical Composition of California Petroleum.

Regarding its ultimate composition, crude petroleum consists essentially of carbon and hydrogen, together with oxygen, with usually widely varying amounts of nitrogen and sulphur. California crude oils contain from 0.5 to 1.2 per cent. nitrogen. The occurrence of sulphur in crude oil is due to the fact that free sulphur is always present in the earth's crust, though in highly variable amounts. Sulphur is freely soluble in oil, and occurs in the crude petroleum, not only in a mere solution but also very firmly combined to carbon and hydrogen, as thio-ethers and mercaptans, commonly called organic sulphur.

California crude oil greatly varies in character, some oils being of a greenish or bluish fluorescence, while others are viscid and almost black. The specific gravity ranges from 0.993 to 0.850 or from 11° B. to 34° B. The oils of California contain sometimes as much as 45 per cent. asphaltum, for which reason the gasoline test for determination of foreign matter in the oil is not always practicable, on account of the asphaltine forming a sludge with the gasoline. The centrifugal test is more correct, but the only way to determine accurately the percentage of water and foreign matter in crude petroleum is the distillation test.

The amount of sulphur in California crude oil varies between 0.5 per cent and 2.5 per cent. The only thoroughly satisfactory process for determination of sulphur is that of combustion in oxygen in the Mahler bomb and determination in the usual way as barium sulphate.

Table No. 1.—*Production Crude Oil in California.*

Year.	Quantity, Barrels.
1910—Six months, ended June 30	36,584,364
1909—Twelve months, ended Dec. 31	66,976,665

Table No. 2 shows analysis of 78 different samples of California crude oil, taken from oil districts shown on map (page 779).

For the large amount of work in gathering these samples credit is due Mr. Henry C. Kayser, and every analysis was made by him in the laboratory of the Southern California Edison Company at Los Angeles. In collecting the samples to be tested the greatest care was taken, some of them being taken directly at the well, and some from

ANALYSIS OF CALIFORNIA CRUDE OIL

	ORIGIN OF THE OIL		GRAVITY 60°		% WATER			FLASH POINT DEGR. FAHR.	@ TH U.S. CORRECTED TANK MEASURE PER GALLON	FRACTIONAL DISTILLATION					% SULPHUR
			SPEC.	BAUME	BY DISTILLATION	BY CENTRIFUGE	BY SEDIMENT			GASOLINE %	KEROSENE %	FUEL OIL %	ASPHALT %	LOSS %	
1	LOS ANGELES	S.P.CO. WELL 617	0.9598	16	2.5	3.5	6.0	220	17755	0	2.8	52.8	34.8	4.1	2.81
2	DITTO	HARRIS OIL CO.	0.9592	16	0	1.0	2.5	212	17990	0	0	61.0	33.2	3.3	2.95
3	DITTO	OHIDEMO OIL CO.	0.9621	15.5	2.0	4.5	7.0	212	17815	0	2.0	58.1	34.0	2.9	1.99
4	DITTO	UNION OIL CO.	0.9932	18.5	0	0	0.5	205	18109	0.2	3.0	64.4	25.0	2.9	1.10
5	DITTO	MRS. SUMNER	0.9757	13.5	0	1.5	2.9	270	18310	0	2.8	58.6	32.5	3.2	1.01
6	DITTO	AMALGAMATED	0.9499	17.5	0	0.5	1.0	210	18105	0.2	3.5	67.5	25.3	2.5	1.97
7	WHITTIER	NUTWOOD OIL CO.	0.9932	18.6	1.75	3.7	4.6	OVER 200	18295	0.8	9.0	59.75	23.5	2.35	0.76
8	DITTO	UNION OIL CO.	0.9402	19	0	0	0.8	90	18319	2	10.2	62.3	23.8	1.9	0.66
9	DITTO	NUTWOOD LOS NIETOS TANK 21	0.9575	19.5	0	0.5	1.3	180	18352	0.6	10.1	62.6	22.9	2.1	0.67
10	DITTO	DITTO TANK 82	0.9425	18.5	1.0	2.1	3.5	OVER 200	18381	0.9	10.5	59.8	23.0	2.3	0.91
11	DITTO	CENTRAL OIL CO.	0.9580	21	0	0	0.6	85	18675	2.6	14.6	57.1	21.7	3.4	0.53
12	DITTO	CENTRAL OIL CO.	0.9368	19.5	3	4.8	6.5	90	18410	0.8	11.0	57.7	22.9	1.1	0.68
13	NEWHALL		0.9585	16.1	0	0	0.3	175	17610	0.4	11.8	58.1	25.6	3.8	0.74
14	DITTO		0.9449	18.3	0	0	TRACE	170	17775	0.7	12.6	58.7	25.1	2.9	0.62
15	FULLERTON		0.8565	33.5	0	0	TRACE	BELOW 80	19495	24.9	25.0	35.1	13.6	1.4	0.87
16	DITTO		0.9252	21.5	0	0	0.8	160	19010	5.1	11.2	55.3	25.1	2.5	0.92
17	PUENTE		0.8861	28.6	0	0	TRACE	BELOW 80	19270	14.3	24.9	35.9	22.8	2.1	0.79
18	BREA CANYON	PICO WELL	0.9253	21.5	0.5	1.5	3.0	95	18871	4.1	9.8	52.3	21.0	3.8	0.77
19	DITTO	GRAHAM & LAPTON	0.9264	21.5	0	0	1.9	89	19010	3.5	11.2	59.2	21.3	2.9	0.66
20	DITTO	INDUSTRIAL 81	0.9402	19	0	1.0	5.4	200	18475	0.7	12.0	55.1	22.9	3.8	0.72
21	DITTO	INDUSTRIAL 82	0.9571	19.5	0	0	4.9	OVER 200	18500	0.9	12.3	55.5	22.7	3.7	0.51
22	DITTO	PUENTE OIL CO.	0.8785	29.5	0	0	0	75	19559	26.0	19.3	40.4	12.7	1.6	1.62
23	SALT LAKE	RODEO LAND CO.	0.9722	14	1.0	2.5	4.5	265	17615	0	2.0	57.5	33.8	2.2	2.11
24	DITTO	SALT LAKE OIL	0.9565	16.5	1.0	2.5	4.8	165	18771	0.5	5.0	54.4	29.5	2.6	2.32
25	DITTO	WEST COAST	0.9490	19	0	0	2.3	94	18810	0.9	13.0	58.1	22.6	3.1	1.97
26	SUMMERLAND	GIFFELL & SON	0.9666	14.6	2.5	3.5	4.5	270	18571	0	3.0	58.7	32.0	1.6	1.08
27	DITTO	GIFFELL & SON	0.9702	14.3	2.0	2.5	3.9	310	18601	0	3.0	57.7	32.6	2.9	0.99
28	DITTO	BENNETT 81	0.9814	12.6	2.5	3.5	4.3	304	18489	0	2.5	56.4	34.0	2.6	0.92
29	DITTO	BENNETT 82	0.9778	13	2.5	3.5	4.7	310	18511	0	3.0	57.4	34.0	2.6	0.95
30	DITTO	HASSLINGER	0.9775	13	1.0	2.0	2.6	308	18472	0	3.0	56.5	33.6	4.2	0.89
31	DITTO	SEASIDE 81	0.9787	13.1	2.3	3.5	4.3	308	18498	0	3.0	56.4	34.0	1.9	0.91
32	DITTO	SEASIDE 82	0.9778	13	1.5	2.0	3.6	310	18505	0	3.0	56.3	34.0	3.1	0.91
33	DITTO	G.F. BEYMER	0.9660	15.3	2.0	2.4	4.5	210	18437	0	3.0	52.1	31.3	3.1	0.75
34	SANTA MARIA	UNION OIL CO.	0.9989	24.6	0	0	1.0	75	19114	5.0	12.5	61.2	17.0	4.3	1.55
35	DITTO	WESTERN UNION	0.9989	25	0	0	0.5	80	19070	7.0	11.9	61.5	15.2	0.9	1.61
36	DITTO	DOME OIL	0.9961	24.0	0	0	1.2	75	18974	5.0	12.8	60.6	17.5	2.9	1.75
37	DITTO	PALMER OIL	0.9758	13.5	0	1.5	2.9	270	18365	0	2.8	58.6	32.5	3.2	1.52
38	SANTA PAULA	LAPP-HUNTINGTON	0.9931	27	0	0	TRACE	75	19215	15.1	17.5	53.8	11.5	2.1	0.62
39	DITTO	COSMOPOLITAN	0.9654	32	0	1.0	2.9	BELOW 80	19419	18.9	13.5	52.8	10.0	1.9	0.70
40	KERN RIVER	SANTA FE	0.9660	12.4	0.5	1.5	3.2	295	17825	0	0	58.9	36.8	3.1	1.02
41	DITTO	DITTO	0.9681	14.6	0	0	0.4	285	17910	0	2.0	60.8	34.9	1.9	1.10
42	DITTO	DITTO	0.9659	15	0	0	0.5	280	18210	0	2.0	61.3	32.1	4.1	1.46
43	DITTO	AMER. CRUDE	0.9725	14	1.0	1.9	3.5	290	18115	0	0	58.2	35.1	3.2	0.98
44	DITTO	REED CRUDE	0.9765	13.1	1.5	2.5	6.3	310	17910	0	0	56.6	36.3	0.8	1.11
45	DITTO	BANNER'S OIL	0.9657	15	0	0	0.8	276	18010	0	2.0	60.1	34.4	0.7	1.02
46	DITTO	STAUFFER	0.9688	14.5	0	0	0.6	290	18284	0	1.5	60.4	35.6	1.9	0.96
47	DITTO	UNION	0.9589	17	0	0	0.4	275	18115	0	2.0	58.7	36.1	2.8	0.93
48	MC KITTRICK	STATE OIL	0.9891	16	0	0	1.1	230	18369	0	3.0	59.4	33.2	3.3	1.30
49	DITTO	STATE OIL	0.9655	12.3	2.5	4.6	7.6	318	17775	0	0	58.0	39.1	2.3	0.91
50	DITTO	DELMONTE	0.9586	16.5	3.0	4.5	6.9	180	18205	1.0	3.0	58.9	34.0	4.2	0.98
51	DITTO	REWARD	0.9580	17	0	0	TRACE	210	18615	0.5	3.0	62.5	31.9	2.1	0.97
52	DITTO	SANTA FE	0.9593	16	0	0	0.2	225	18339	0	2.5	63.3	33.1	0.9	1.91
53	SUNSET	WELLMAN	0.9933	18.5	0	0	0.5	OVER 200	18885	1.0	9.2	57.4	30.0	2.1	1.02
54	DITTO	UNION	0.9416	18.9	0	0	0.8	180	19019	1.0	9.5	58.8	28.7	2.2	1.30
55	DITTO	UNION	0.9931	11	2.5	5.0	8.1	330	17483	0	0	46.8	41.0	4.1	1.32
56	DITTO	K.T. AND O.	0.9790	13	0.5	1.0	2.2	300	17690	0	0	52.9	39.0	3.9	1.09
57	DITTO	DITTO	0.9584	17.0	0	0	1.0	190	18199	2.2	11.3	57.5	31.9	2.1	0.98
58	DITTO	DITTO	0.9428	18.5	0	0	0.8	185	18310	2.5	13.0	57.3	24.3	2.1	1.31
59	DITTO	ETHEL D.	0.9858	12.5	1.0	2.0	4.1	320	17911	0	0	54.6	38.2	3.1	1.28
60	MIDWAY	ASSOCIATED	0.9911	25.8	0	0	TRACE	65	19125	21.0	20.0	41.6	13.1	4.3	1.19
61	DITTO	STANDARD	0.9130	23.5	0	0	0	68	19091	19.0	22.0	45.0	15.1	0.9	1.19
62	DITTO	DITTO	0.9782	14	0	0.5	1.5	275	18010	0	2.0	66.0	28.7	1.0	0.96
63	DITTO	DITTO	0.9932	18.5	0	1.1	3.2	205	18990	2.8	12.8	46.8	32.1	2.3	0.82
64	DITTO	SANTA FE	0.9934	18.5	0.5	1.5	3.5	OVER 200	19005	3.0	13.0	43.3	33.2	4.0	1.09
65	DITTO	EAGLE CREEK	0.9941	15.5	1.0	2.0	3.6	240	18111	0	2.0	60.4	30.9	3.1	1.10
66	CORALINGA	AMER PETROL	0.9598	17.5	0	1.2	2.8	308	18411	0	2.0	61.4	31.5	2.8	0.81
67	DITTO	DITTO	0.9812	19	0	0	0.6	310	18684	1.6	12.0	55.0	29.0	1.9	0.78
68	DITTO	" DITTO	0.9660	12	1.0	2.5	4.0	280	18125	0	0	56.8	36.1	4.1	0.77
69	DITTO	UNION	0.9551	16.5	0	0	1.0	170	18430	0	2.0	62.0	27.1	3.9	0.68
70	DITTO	ASSOCIATED	0.9933	18.5	0	0	0.7	OVER 200	18680	0	2.0	71.1	23.0	3.2	0.73
71	DITTO	STANDARD	0.9105	24	0	0	TRACE	75	19020	2.0	16.0	64.2	13.0	2.8	0.69
72	DITTO	PREMIER	0.9322	22	0	0	0.2	90	18975	1.5	14.0	66.7	14.5	3.1	0.74
73	DITTO	ASSOCIATED	0.9800	12.3	2.0	2.5	4.7	310	17615	0	0	52.3	39.7	3.3	0.68
74	DITTO	K.T. AND O.	0.9931	15.5	1.0	1.8	3.0	276	18117	0	2.0	61.1	33.1	0.8	0.69
75	DITTO	DITTO	0.9903	19	0	0	0.3	160	18610	4.0	12.4	57.7	24.3	1.3	0.70
76	DITTO	DITTO	0.9459	18.1	1.0	2.0	3.2	170	18705	0.5	11.0	60.3	21.7	3.3	0.76
77	DITTO	ASSOCIATED	0.9935	18.2	2.5	3.5	5.6	325	17985	0	0	52.5	41.0	0.9	0.71
78	DITTO	BRIT. CONSOL.	0.9736	13.2	1.5	3.9	7.5	315	18027	0	0	55.2	34.0	3.3	0.70

storage tanks, while others were taken from tank cars as received at the gas plants. The samples were taken with a so-called "oil-thief" and placed in a large receptacle and the whole thoroughly mixed. In all cases the specific gravity was ascertained by picnometer at 60° F., after the water was allowed to settle.

Summary of the Oil Situation in California.

Los Angeles field, with its extension toward Santa Monica (Salt Lake, Sherman, Beverly, Malba) will be a large factor in the oil market for many years to come, although most of the wells show a high percentage in sulphur. The oil from the Whittier field is sought after by the refiners and the gas plants in Los Angeles and its vicinity. The output is still increasing. The Santa Fe Railway practically controls the entire production of the Fullerton field. The output is being increased yearly. The wells of the Puente fields reached their maximum; the output per month is small and does not exceed 3,000 barrels. The oil from the Newhall field is out of the question for gas works; most of the product goes to the Standard's refineries.

Santa Paula oil is first-class for gas making, containing less than 1 per cent. of sulphur. The oil is of light gravity. Transportation facilities are excellent, but production seems to have reached its maximum.

The oil from the Santa Maria field contains between 1.50 and 1.75 per cent. sulphur. In some, oil-water trouble is met with. Production is increasing. The Union Oil Company handles about four-fifths of the entire production.

The production of the Summerland field is rapidly decreasing. All of the oils contain over 1 per cent. sulphur.

On an average the oil from the Coalinga field yields less than 1 per cent. sulphur, and transportation facilities consist of pipe lines to Monterey, Point Richmond and Port Costa. The production is increasing.

The production in Kern County, comprising Kern river, McKittrick, Midway and Sunset (Maricopa), is rapidly increasing, through several gushers struck in March, 1910.

By reference to Table No. 1 it will be seen that this increase for Kern County was, from 2,272,614 barrels, in January, 1910, to 4,078,477 barrels, in June of the same year. The oil is of good quality and the transportation facilities will be developed more and more.

Experts who have studied the fields have reported that the oil beds in California will be prolific producers for more than half a century. A geologist, who is considered an authority on oil, has stated that the present proven oil territories of California were sufficient to produce at least 75,000,000 barrels every year for the next 50 years. The price of oil has always been subject to severe fluctuations. From experience we know that, when we had only a few wells in California, oil was selling as high as 75 cents a barrel; with the increase in number of wells and no readiness for the consumption, the oil dropped as low as 10 cents a barrel. Later on, while the consumption was increasing, oil went up again. The questions of supply and demand, production and consumption, are very important ones. We know that when the consumption increases and the demand becomes greater, the price of oil goes up; on the contrary, when production is greater than consumption, the price must naturally sink, unless there is enough storage capacity. Since March, 1910, through the big gushers in Maricopa, the production was on the increase. In March the average daily production for the Coast, San Joaquin Valley, and Southern fields combined, amounted to:

	Barre'ls.
Average daily production.....	194,278
The average daily consumption reached.....	183,209
Average daily surplus.....	11,069
The stocks, February 28th, 1910, amounted to..	19,225,950
" " March 31st, " " " ..	19,569,085
" " April 30th, " " " ..	20,704,352
" " May 31st, " " " ..	22,940,599

Recent data in reference to surplus stock have not been obtainable. The oil producers show a tendency to withhold the information. Unquestionably there is overproduction, and just now this condition is making buyers hold off, expecting a break in the price. The great marketing concerns will probably be unable to handle for a time the output of some of the big wells. On the other hand, transportation facilities are also increasing, but they do not seem to keep up the race with the production, proof: The steady monthly increase of storage.

[Continued from page 725.]

Liability of Gas Companies for Injuries Resulting from Escape of Gas.

[Prepared for the JOURNAL, by MR. JOHN EDSON BRADY, Attorney-at-Law.]

Injuries Caused by Inhalation.

Injuries Resulting from Shutting Gas Off and Turning it On Again Without Notice.—It would be obvious that there is danger in shutting off the gas from a house or district without notifying the consumers affected, for as soon as the gas is again turned on it flows from the points where it was burning before being shut off; but serious accidents have resulted from negligence of this character. One of the cases coming under this head is that of Beyer *v.* Consolidated Gas Company; 44 N. Y. App. Div., 158 (1899). The plaintiff in that case, who occupied one floor of the apartment house, had the defendant Company install the connections for a gas stove in one of her rooms. There had been trouble with the flow of gas through the house, and, at the request of the landlord, the Company sent two men to remedy the defect. Just before the men arrived the plaintiff lighted her gas stove and lay down for a nap. While she was sleeping the men who had been sent by the Company arrived, shut off the gas from the entire house and disconnected the pipes. They blew out the water from the pipes, reconnected them, and again turned on the gas. The result of this was to cause the gas to flow through the plaintiff's radiator, and the gas which she inhaled injured her seriously. The men claimed that they went through the house to notify the tenants before turning the gas off, and that they received no response from the plaintiff's apartment. The plaintiff claimed that they were negligent in not using more efficient means to arouse her. In holding the Company liable the court said: "Undoubtedly, when these men went to that place for the purpose of interfering with the flow of gas through the pipes, it was their duty to use proper care to see that the occupants of the

rooms had an opportunity to protect themselves against the results which follow from tampering with the flow of gas. The care which was required of them for that purpose was commensurate with the danger which might result to an occupant of the room, if for any reason the gas might flow into it without being lighted, which everyone knows might be the means of causing an explosion, or would be likely to suffocate any person who might be in the room. * * * A reading of the evidence satisfies us that the jury were justified in believing the witnesses for the plaintiff as to what was done by way of warning her by the servants of the defendant, and they were justified, too, in finding that the defendant's servants did not use proper means to warn the plaintiff, and were, therefore, guilty of negligence."

In Skoglund *v.* St. Paul Gas Light Company; 89 Minn., 1; 93 N. W. Rep., 668 (1903), the Company escaped by reason of the fortunate interference of a third party. The plaintiff was a boarder in a private boarding house conducted by Mrs. Lapham in the city of St. Paul, Minn. On a day in January, 1902, the gas pressure being insufficient because of the frost in the pipes, the Company was notified, and at about 8 o'clock in the evening one of its employees came to remedy the defect. Mrs. Lapham talked with the man and showed him the way to the cellar or basement, where he turned off the gas, thawed out the pipe in the usual manner and again turned on the gas. While the employee was in the basement Mrs. Lapham and one of her boarders turned out the gas jets in the various rooms. They believed that they had turned out every jet, but those in the room occupied by the plaintiff were overlooked. The plaintiff, it seems, before the arrival of the employee, had gone to her room to read, but had fallen asleep with the gas burning and the doors and windows closed, so that when the gas was again turned on she inhaled it until the odor was detected coming from her room and she was aroused. She sued the Company to recover damages for injury to her health, claiming that it was the Company's duty to see that all jets were turned off before making any repairs. But it was held that, under these circumstances, the Company was not liable. The rule was stated by the court as follows: "If, when summoned, the respondent's (Company's) representative had gone to the house, and merely stated to the landlady that he had come to make repairs, without telling her that the gas would be turned off, then, under such circumstances, it may be conceded the Company would be liable for damages; but if he notified the person in charge of the house that the gas would be turned off, in our opinion respondent did all that could be reasonably required, and, if Mrs. Lapham failed to properly notify her boarders or to personally turn out the lights in the various rooms, then the responsibility cannot be placed upon the Company. It would be an unreasonable demand to require the Company to go through the house and look at each jet to see that it was properly turned off, or to notify all the occupants to that effect. The landlady was the representative of the members of her household, and it was with her that the Company transacted its business. It was called by her to correct the fault, and she would naturally be the person to notify what was to be done."

Where a Gas Company May Be Liable for the Injurious Effects of Sewer Gas.—In an action against a gas company for an injury to the health of the plaintiffs resultant upon their inhalation of gas which escaped from the defendant's pipes, the judge instructed the jury that the defendant was equally liable whether the plaintiffs were injured and made sick by the defendant's gas alone, or by gases generated in the sewer and drain through which it passed, if the same were carried by the defendant's gas into the house; provided they should find that the plaintiffs were not guilty of negligence, and that the defendant was guilty of negligence. This instruction was objected to by the defendant Company, and, on an appeal taken by the Company from a judgment for the plaintiffs, it was held that the instruction was proper. "If," said the court, "through the negligence of the defendants, a current of their gas was set in motion, and in its course through the sewer and drain it took up other gases which were noxious and carried them into the house, and the plaintiffs were made sick thereby, the defendant's negligence was as much the proximate cause of the injury as if their own gas had occasioned it. It would be like the case of a mill owner who should negligently suffer his dam to give way, whereby the meadow of his neighbor below him is overflowed. If the flood in its course should take up stones and gravel, and carry them upon the meadow, the mill owner would be liable as well for the damage caused by the stones and gravel as for damage caused by the water, on the ground that the whole injury was alike the proximate consequence of his fault." Hunt *v.* Lowell Gas Light Company; 90 Mass., 169.

(To be Continued.)

Items of Interest
FROM VARIOUS LOCALITIES.

CERTAIN residents of Pottsville, Pa., have determined to construct and operate a gas works in Minorsville, Pa., the title of the Company to be that of the Peoples Gas Company.

MESSRS. F. E. AND P. A. MYERS, of Ashland, O., are considering the advisability of constructing a gas plant in that city. If the old main system can be successfully put at work they estimate that an expenditure of $20,000 will be sufficient for the purpose in view.

AT last the proprietors of the Bristol (Pa.) Gas Company—it is now operated under lease by the Public Service Gas Company, of New Jersey—have determined to take advantage of a field right at their doors, which might have been yielding a golden harvest for years, were it not for an indifference, seemingly inexplicable. However, they are planning an extension of the main system to the adjoining healthily growing settlements of Newton, Langhorne, Hulmsville and West Bristol.

MR. CHARLES D. HALSEY, Superintendent of Distribution, Consolidated (N. J.) Gas Company, while engaged in turning off the current from the Low Moor Cottage, Long Branch, N. J., was so shocked by an electric current that death was instantaneous. He was in his 32d year, and had been in the service of the Company for some years.

THE proprietors of the Coos Bay Gas and Electric Company, of Marshfield, Ore., have decided to enlarge the generating plant, and it is also likely that another storage holder will be constructed.

MR. S. P. PARKS forwards the following from Buffalo, N. Y., under date of the 12th inst.: "Last week an agreement was reached between the city authorities and the Buffalo Gas Company, which was in settlement of the mooted question of bearing the expense of putting down service pipes to and from meters. The controversy was brought before the Public Service Commission for the up-State district, and a hearing was conducted, October 7th, during which points in controversy were dissected and determined. The result of it (the inquiry) is that the Corporation Counsel (Mr. Hammond) has formulated new tenets, which seem to be all in favor of the tenant. In these specifications it is provided that when an application is made for a service pipe the applicant shall deposit with the gas company a sum sufficient to pay the city's charges for openings necessary to be made in the street, as well as to the cost of repairing the pavement, if any. The amount of this deposit is to be estimated by the Company, which is required, after the work has been done, to adjust it so that the cost to the owner is the actual disbursement of the Company. For the service pipe from the curb line to the building the applicant must agree (a) To pay at the rate of 25 cents per foot for pipe 1¼ inches in diameter, 27 cents for 1½-inch pipe, and 30 cents for 2 inch pipe, and the actual extra cost of rock excavation if rock is encountered; or (b) to pay the actual cost of the installation and deposit enough to cover the cost as estimated by the Company, the remainder, if any, to be returned to the applicant. Measurement is to be from the curb, or main when it is inside the curb, to the meter, which must be placed as near to the front wall of the building as is practicable. The above charges include ordinary maintenance and repairs, but do not include cost of alterations or breakages due to no fault of the Company, nor the cost of permits or repairs to pavement made necessary by alterations or breakage. Any work by the Company within the building and beyond the meter must be paid for by the owner. While connected with the Company's main and meter the service pipe shall not be used for any other purpose than carrying gas supplied by the Company without special written agreement with the Company. The rules conclude with the settlement of the hardest fought proposition of the whole, and says: If the owner wishes to have the service disconnected from his house piping or his service pipe, he shall give 3 days' notice in writing to the Company at its principal office in the city of Buffalo, that he wishes the Company so to disconnect. Whereupon the Company shall within 3 days disconnect without charge."

AT the annual meeting of the Easthampton (Mass.) Gas Company the officers elected were: Directors, P. Cabot, C. W. Haselton, J. W. Stevens, H. S. Thompson, J. N. Lyman, H. L. Clark, C. H. Johnson, D. Barry, C. F. Davoll; President, P. Cabot, Boston; Vice-President, H. S. Thompson, Boston; Clerk and Treasurer, J. N. Lyman. The Company's affairs are in satisfactory shape for the fall and winter campaign.

"L. M. M," forwards the following from St. Louis, Mo., under date of the 10th inst.: "Some days ago the proprietors of the Laclede Gas Light Company announced that a reduction in the rate for illuminating gas to 80 cents per 1,000 cubic feet would be made instanter if the Municipal Council or Assembly would change the testing standard from a lighting to a heating unit. To further the alteration a bill to such effect was introduced in the House of Delegates. The franchise under which the Laclede Company can operate in St. Louis until 1920 would prevent the piping of natural gas in its mains unless the Company was willing to pay a daily fine of $250. If the heat

unit test is substituted the Laclede will be free to supply natural gas without obtaining a new franchise. Under its present franchise the Public Service Commission has no authority to regulate its rates, in the light of decisions by the Missouri Supreme Court. The bill also provides that 50 cents per 1,000 feet shall be the maximum charge for natural gas if the Company should decide to supply it."

MR. M. JESSE BRAYTON, Secretary and General Manager of the Utica (N. Y.) Gas and Electric Company since 1910, has been appointed to the Republican State Committee for the 27th New York Congressional District. Of a verity, Mr. Anthony N. Brady has many friends in both camps.

REORGANIZED eh! And with Mr. Avery C. Sickels as one of the reorganizers. Well, we declare! Which ejaculations are caused by the receipt of the following which is in from Bloomsburg, Pa., under date of the 12th inst.: "The Nescopeck, Salem and Briar Creek Gas Companies, which organizations received charters from Governor Stuart, of Pennsylvania, some months ago, were reorganized last week, the following executive management having been chosen: President, T. H. Doan; Secretary and Treasurer, R. O. Brockway; Directors, the officers and Messrs. Avery C. Sickels and F. E. Brockway. Wonder what Banker Janes, of Berwick, Pa., thinks of this in general, and of Mr. Sickels in particular. Dear, dear!

A FEATURE of the good work that is being done in Charlotte, N. C., by the Woman's Club of that city, in connection with the household economic division thereof, was the work done by Miss Craig, of Boston, who last week gave a demonstration of her art. The gas range was set up in its usual place in the offices of the Charlotte Consolidated Construction Company—Miss Craig has been conducting for the Light and Power Company a series of lectures on the use of gas in the household, the course covering an exposition lasting through several days and nights—and the gifted lecturess held the attention of an interested audience, the result of which will surely be of lasting benefit to many, if not all, of the Woman's Club representative who listened to Miss Craig's terse sentences, and who watched her deft movements. It may be taken for granted, too, that the "Four C's" corporation will have a goodly part of the after results.

ALD. F. J. U. SHINNICK is responsible for the placing of a resolution before the local legislature of Kansas City, Mo., which seeks to prohibit the construction in that city of storage tanks for gas (either natural or artificial) within 300 feet of any building used for residence purposes. To this might be added that it was the Shinnick coterie who, last December, were urging the revocation of the right of way under which the Company supplies natural gas in the named city, the contention being based on the Company's failure to keep up sufficient pressure in certain districts during certain spells of abnormally low temperature. In order that all danger of such complaint might be finally averted, the Company had arranged this season for the construction of a leviathan holder, which vessel would insure an adequate supply of gas, despite the temperature conditions. The location of the holder having been announced, the Shinnick team is to the fore with all sorts of shinnie sticks that are being brandished to the slogan of "Keep your holder off our side." While it is not likely the Shinnick scheme will be eventually countenanced, it nevertheless pointedly marks the hollowness of the pretension that the blows last year aimed at the Kansas City Company were for "the good of all."

WRITING of the Kansas City holder recalls the fact that its likely location is at 20th street and Indiana avenue, and that it will be rated to store 5,000,000 cubic feet.

SOME days ago in the Superior Court, Newburyport (Mass.) District, a jury returned a verdict, in the case entitled, Morse *vs.* the Newburyport Gas and Electric Company, assessing damages against defendant in the sum of $381. Plaintiff alleged that the smoke and other fumes arising from the works of the defendant, which were in close proximity to the residence of the plaintiff, had rendered it uninhabitable almost, had damaged his curtains, carpets, etc., in fact, had depreciated the value thereof, all round. The jury agreed with plaintiff's presentation, assessing damages in the sum named. The case will be appealed.

THE Royal Manufacturing Company, of Columbus, O., has been incorporated, with a view to the outputting of mantles for gas lamps. Its incorporators are Messrs. J. D. Morse, O. C. Darst, A. W. Williams, W. D. Morse and G. E. Sonnanotine. It is capitalized in $50,000.

THE following Trustees were elected for the 2-year term to serve on the Board of the Massachusetts Gas Companies: Messrs. F. E. Snow, Albert Strauss, Chas. Stone, Robert Winsor and C. Minot Weld.

THE gas engine division of the Progressive Manufacturing Company, of Torrington, Conn., has been removed to Newark, N. J. Its Superintendent is Mr. Chas. Newton, of Torrington.

"MR. JOHN HEALY, for 55 years a resident of Manchester, N. H., over 2 score of which were spent in the employ of the Peoples Gas Light Company (and its predecessors), of that city, died at his home on Auburn street, Manchester, the morning of the 6th inst. Deceased was in his 80th year, and I am not wide of the mark in saying, despite the lack of grandeur in his way of life, that no other citizen of Manchester was more respected, or more worthy of respect.—SIDNEY."

THE ordinance adopted in referendum vote by the voters of Los Angeles, Cal., June 30, 1910, has been adjudged valid, by Judge Courcy of the Superior Court, in a decision handed down early this month. The contestants were the Los Angeles Gas and Electric Corporation and the California Edison Company for the Southern district. The tax objected to was one levying ½ of 1 per cent. on the gross receipts for the sale of gas and electric currents, the tax to be paid quarterly.

THE producer plant of the Delaware, Lackawanna and Western Railroad, which is intended to furnish fuel for operating the forges, etc., in its Scranton (Pa.) shops, is said to have been successfully fired up under the direction of Mr. Charles Lampkin, aided by Messrs. McDermott, Regal and Brown. This plant has, as part of its equipment, a holder up to retaining 300,000 cubic feet.

THE proprietors of the Consolidated Gas, Electric Light and Power Company propose to become half owners of a building to be fitted up with gas and electric currents for users of small power. The enterprise will be in the nature of a joint-stock affair, and the Directors of the Company have pledged themselves to subscribe $100,000 towards the necessary establishings, or ½ the amount considered necessary to put the affair on a working basis. On the face of it this looks good, but is it a wise move to antagonize the thought of the many owners of small premises now occupied by producers on a small scale? It looks at first blush that fair objection could be lodged against the plan.

THE proprietors of the Corry (Pa.) Electric Light Company have been awarded a franchise for the supplying of gas to the residents of that place for a period of 35 years. The only compensation exacted is that the Company shall furnish free gas to the public buildings (presumably the City Hall) for the life of the franchise.

MR. FRANK A. WOODHEAD, Superintendent of the Hoosick Falls (N. Y.) Fidelity Gas Company, since 1908, has resigned that post in order to accept the position of Assistant to Engineer of Construction, Brooklyn Union Gas Company.

THE petition of the New Bedford (Mass.) Gas and Edison Light Company, for permission to stretch or lay a gas main across the Acushnet river between Fairhaven and New Bedford, has been assented to by the State Board of Harbor and Land Commissioners. This means that Fairhaven will shortly enjoy the benefits of gas in their homes.

AT the special meeting of the shareholders in the Washington (D.C.) Gas Light Company, held for the purpose of approving resolutions, the substance of which was that the Company shall hereafter pay dividends (not exceeding 6 per cent. per annum), based on an actual physical valuation of the property of the Company, voted unanimously in favor of the proposition.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

971,581. Gas Lamp. E. J. Wiggins, Chicago, Ills., assignor, by direct and mesne assignments, to Knu Light, Heat and Power Company, same place.

971,705. Gas Meter. F. C. Viney, Philadelphia, Pa., assignor to the Standard Meter Company, same place.

971,769. Pilot Light for Gas Stoves. E. R. Mayer and J. G. Keegan, Denver, Col., assignors of one-third to A. E. Wilson, same place.

THE AMERICAN GAS LIGHT JOURNAL

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MONDAY, OCTOBER 24, 1910.

The Market for Gas Securities.

The improvement in the general market is likely chargeable with the marked advance scored by Consolidated and Brooklyn Union this week. The gain is virtually 2 points, which must be regarded as a positive movement, remembering that it followed a like gain recorded only a week ago. Let the financiers study as they will, figure as they may, the shares in the two Companies noted above are still very many points below their real value.

Peoples, of Chicago, remains steady, and Lacledes (both classes) have been active and considerably higher. The common is 105½ to 106. The general outlook for an advance has not been so favorable since 1906.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

OCTOBER 24.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	13[illegible]¾	138
Central Union Gas Co. —				
1st 5's, due 1972, J. & J.	8,000,000	1,000	98	101
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual Gas Co.	3,600,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98¼	100¼
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	104	107
Con. 5's, due 1945, J. & J.	3,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	—	75
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	138½	140
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106⅛	107
Yonkers	399,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	5/8	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	90	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	73	73½
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	20,500,000	100	92	98
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	106½	—
Mortgages, 6's	3,600,000		89	100
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co	5,000,000	50	—	50
" Prior Lien 5's	4,619,000	1,000	97	100½
Detroit Gas Co., 5's	881,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,225,000	1,000	104⅜	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113⅜
" Bonds, 5's	10,500,000	—	108	108⅜
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis	10,000,000	100	105½	106
Preferred	2,500,006	100	91	102
Bonds	10,000,000	1,000	102⅜	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	60	60¼
Massachusetts Gas Companies, of Boston	25,000,000	100	85¼	86
Preferred	25,000,000	100	95	95¼
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	109	109½
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	--
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	100	102
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	90	95
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	100	104
Washington (D. C.) Gas Co.	1,600,000	200	382½	385
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

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New York Improved Meter Co., New York City. 798

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia. 815
D. McDonald & Co., Albany, N. Y. 813
Helme & McIlhenny, Philadelphia, Pa. 815
John J. Griffin & Co., Philadelphia, Pa. 768
Keystone Meter Co., Royersford, Pa. 814
Nathaniel Tufts Meter Co., Boston, Mass. 814
New York Improved Meter Co. New York City. 814
Pittsburg Meter Co., East Pittsburg, Pa. 798
Sprague Meter Co., Bridgeport, Conn. 813

PROCESSES.

Bartlett-Hayward Co., Baltimore, Md. 809
Fred Bredel Co., Milwaukee, Wis. 811
Humphreys & Glasgow, New York City. 808
Improved Equipment Company, New York City. 789
The Gas Machinery Co., Cleveland, O. 791
The United Gas Improvement Co., Philadelphia, Pa. 803
Western Gas Construction Co., Fort Wayne, Ind. 816

PRODUCER POWER PLANTS.

R. D. Wood & Co., Philadelphia, Pa. 814

PURIFIER AND SCRUBBER TRAYS.

Bartlett-Hayward Co., Baltimore, Md. 809
Cabot Mfg. Co., Hoboken, N. J. 807
Western Gas Construction Co., Fort Wayne, Ind. 8 6

PURIFIERS.

Bartlett-Hayward & Co., Baltimore, Md. 809
Connelly Iron Sponge & Governor Co., New York City. 805
Cruse-Kemper Co., Ambler, Pa. 796
Davis & Farnum Mfg. Co., Waltham, Mass. 808
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Isbell-Porter Co., Newark, N. J. 795
Kerr Murray Mfg. Co., Fort Wayne, Ind. 806
Quintard Iron Works, New York City. 797
R. D. Wood & Co., Philadelphia, Pa. 814
The Gas Machinery Co., Cleveland, O. 791
The Stacey Mfg. Co., Cincinnati, O 811
The United Gas Improvement Co., Philadelphia, Pa. 803
Western Gas Construction Co., Fort Wayne, Ind. 816

PURIFYING MATERIALS.

Connelly Iron Sponge & Governor Co., New York City 805
The United Gas Improvement Co., Philadelphia, Pa. 803

REGENERATIVE FURNACES.

Baltimore Retort and Firebrick Co., Baltimore, Md. 804
Bartlett, Hayward & Co., Baltimore, Md. 809
Didier-March Co., New York City. 810
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Fred Bredel Co., Milwaukee, Wis. 811
Gas Bench Construction Co., St. Louis, Mo. 797
Improved Equipment Company, New York City. 789
J. H. Gautier & Co., Jersey City, N. J. 804
Laclede-Christy Clay Products Co., St. Louis, Mo. 794
Missouri Firebrick Co., St. Louis, Mo. 804
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 804

RETORTS AND FIREBRICKS.

Baltimore Retort and Firebrick Co., Baltimore, Md. 804
Didier-March Co., New York City. 810
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Fred Bredel Co., Milwaukee, Wis. 811
Gas Bench Construction Co., St. Louis, Mo. 797
Henry Maurer & Son, New York City. 797
Improved Equipment Company, New York City. 789
James Gardner, Jr., Co., Bolivar, Pa. 802
J. H. Gautier & Co., Jersey City, N. J. 804
Laclede-Christy Clay Products Co., St. Louis, Mo. 794
Missouri Firebrick Co., St. Louis, Mo. 804
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 804

RUBBER GOODS.

New York Rubber Co., New York City. 792

SCRUBBERS AND CONDENSERS.

Bartlett-Hayward Co., Baltimore, Md. 809
Cruse-Kemper Co., Amler, Pa. 796
Davis & Farnum Mfg. Co., Waltham, Mass. 798
Evens & Howard Firebrick Co., St. Louis, Mo. 743
Fred Bredel Co., Milwaukee, Wis. 811
Isbell-Porter Co., Newark, N. J. 795
Kerr Murray Mfg. Co., Fort Wayne, Ind. 806
Quintard Iron Works, New York City. 797
R. D. Wood & Co., Philadelphia, Pa. 814
Riter-Conley Mfg. Co., Pittsburgh, Pa. 787
The Gas Machinery Co., Cleveland, O. 791
The Stacey Mfg. Co., Cincinnati, O. 811
The United Gas Improvement Co., Philadelphia, Pa. 803
Western Gas Construction Co., Fort Wayne, Ind. 8 6

SELF-SEALING MOUTHPIECE DOORS.

Bartlett-Hayward Co., Baltimore, Md. 809
Davis & Farnum Mfg. Co., Waltham, Mass. 798
Fred Bredel Co., Milwaukee, Wis. 811
Isbell-Porter Co., Newark, N. J. 795
Improved Equipment Company, New York City. 789
Kerr Murray Mfg. Co., Fort Wayne, Ind. 806
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 804
Quintard Iron Works, New York City. 797
R. D. Wood & Co., Philadelphia, Pa. 814
The Gas Machinery Co., Cleveland, O. 791
The Stacey Mfg. Co., Cincinnati, O. 8 1
Western Gas Construction Co., Fort Wayne, Ind. 816

STOKING MACHINERY.

Fred Bredel Co., Milwaukee, Wis. 811
G. A. Bronder, New York City. 805
Laclede-Christy Clay Products Co., St. Louis, Mo. 794
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 804

STORAGE TANKS.

Bartlett-Hayward Co., Baltimore, Md. 809
Davis & Farnum Mfg. Co., Waltham, Mass. 808
Quintard Iron Works, New York City. 797
The Stacey Mfg. Co., Cincinnati, O. 811
Western Gas Construction Co., Fort Wayne, Ind. 816

STREET LAMPS.

Thos. T. W. Miner, New York City. 794
Welsbach Street Lighting Co., New York and Phila. 802

TAR AND CARBONIC ACID EXTRACTOR.

Bartlett-Hayward Co., Baltimore, Md. 809
Fred Bredel Co., Milwaukee, Wis. 811
Isbell-Porter Co., Newark, N. J. 795
Kerr Murray Mfg. Co., Fort Wayne, Ind. 806
The Gas Machinery Co., Cleveland, O. 791
The Stacey Mfg. Co., Cincinnati, O. 811
The United Gas Improvement Co., Philadelphia, Pa. 803
Western Gas Construction Co., Fort Wayne, Ind. 816

VALVES.

Bartlett-Hayward & Co., Baltimore, Md. 809
Davis & Farnum Mfg. Co., Waltham, Mass. 808
Isbell-Porter Co., Newark, N. J. 795
Kerr Murray Mfg. Co., Fort Wayne, Ind. 806
Ludlow Valve Manufacturing Co., Troy, N. Y. 797
R. D. Wood & Co., Philadelphia, Pa. 814
The Gas Machinery Co., Cleveland, O. 791
The P. H. & F. M. Roots Co., Connersville, Ind. 799
The Stacey Mfg. Co., Cincinnati, O. 811
Western Gas Construction Co., Fort Wayne, Ind. 816

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Gas Bench Construction Co., St. Louis, Mo. 797
Improved Equipment Company, New York City. 789
Laclede-Christy Clay Products Co., St. Louis, Mo. 794
Parker-Russell Mining and Mfg. Co., St. Louis, Mo. 804

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Thorough knowledge of uniform systems of gas accounting and the handling of office forces. Eleven years' experience. At present employed. Can change within 30 days. Best of references furnished.

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Experienced gas man, with 10 years' experience. Capable of demonstrating ability as to operating, accounting and the promotion of sales. A-1 references. Address, "R. N.,"

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WANTED,

Position as Superintendent of Gas Department with Gas and Electric Company in City of Not Less than 30,000.

Can furnish A-No. 1 references from present and past employers. Address, "A. M.,"

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Fifteen years' experience in the manufacture, distribution and construction of high and low pressure coal and water gas of various types. At present manager of a personally rebuilt plant (high pressure). **Worn-Out Western Plants** preferred. Salary first year, $1,380. If results are satisfactory, second salary, $2,000.

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Position as Manager and Superintendent of Gas Plant.

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Must be capable of installing all kinds of gas appliances and must thoroughly understand repairing and testing of meters. Address, "THOROUGH,"

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First-Class Draftsman, Experienced on Gas Bench Construction Work.

Steady position for suitable man. State age, experience and salary expected. Address,

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To approach local companies in their districts, for the purpose of securing engagements for public demonstration lectures on cookery with gas, either from these companies or through these companies, from clubs or societies in their respective cities, thereby to more thoroughly acquaint the public with the superiority of gas for cooking purposes. We have had 15 years' experience in this line of the gas business, are in touch with the various Gas Associations, are known to the gas fraternity everywhere, and can furnish press notices and testimonials from all parts of the United States. Try public lectures in your field and see how many more appliances you can sell through enthusiasm created among the people, besides a liberal commission will be paid for all engagements you secure, your make of range or other household appliances especially pushed in your district and local companies well advertised. No choice as to location. If this looks good to you, address,

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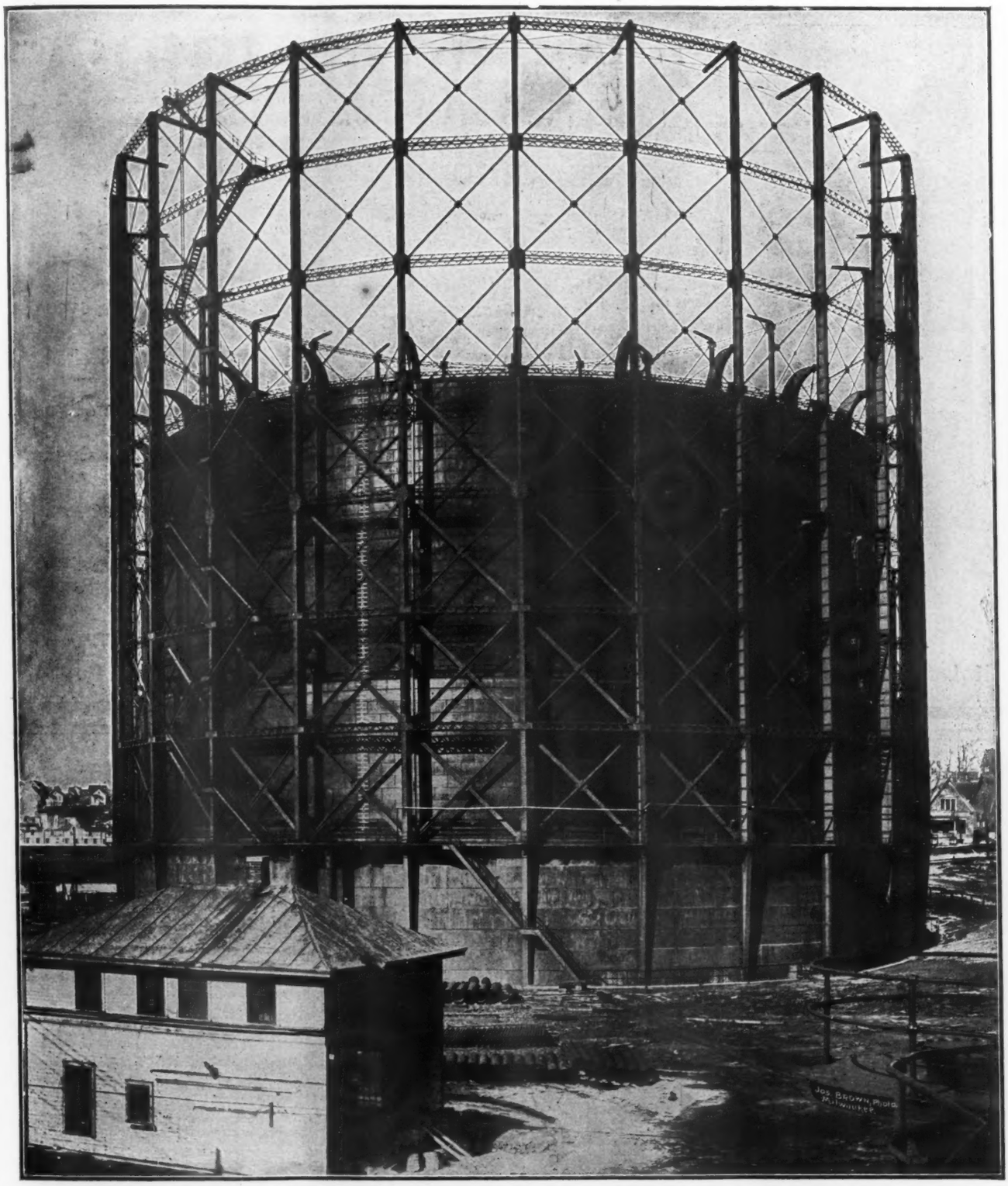

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MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, Oct. 19-21, 1910. New York City. Officers: President, Wm. H. Bradley, N. Y., City Secretary, A. B. Beadle, 29 West 39th street, N. Y. City.

Canadian Gas Association.—Annual meeting, June, 1911. ————. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1910. New York City. Officers: President, C. R. Huntley, Buffalo, N, Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, December. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, A. K. Quinn; Newport, R. I.; Secretary, Walter G. Africa, Manchester, N. H.

Illinois Gas Association.—Annual meeting, time, March, Chicago, Ills. Officers: President, A. S. Harrington, Chicago, Ill.; Secretary-Treasurer, C. R. Strohn, Elgin, Ill.

Illuminating Engineering Society.—Annual meeting, Baltimore, Md., Oct. 24, 25, 1911. Meetings of Sections, monthly. President, W. H. Gartley, Phila., Pa.; Secretary, Preston S Miliar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 227 Fulton street. New England, Secretary, L. D. Gibbs 39 Boylston street, Boston, Mass. Philadelphia, Secretary, F. N. Morton, Broad and Arch streets Chicago, Secretary, T. R. Beebe, 157 Michigan avenue,

Indiana Gas Association.—Annual meeting, January 19, 1911, Fort Wayne, Ind. Officers President, Carl H. Graf, Indianapolis; Vice-President, S. E. Mulholland; Secretary-Treasurer, Philmer Eves, Indianapolis Gas Company, Indianapolis, Ind.

Iowa District Gas Association.—Annual meeting, time, June, 1911, ————. Officers: President, Austin Burt, Waterloo, Ia.; Secretary and Treasurer, G. I Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ———— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. 1911; Battle Creek. Officers: President, A. P. Ewing, Detroit, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 13, 14 and 15, 1911; St. Louis, Mo. Officers: President, R. J. Irvine; Secretary and Treasurer, W. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, December 5-13, 1910 Boston. Officers: President, E. N. Wrightington, Boston; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May 16, 17 and 18, 1911; Pittsburgh, Pa. Officers: President, John M. Garard, Columbus, O, Secretary, T. C. Jones, Delaware, O. Editor Wrinkle Department, F. W. Stone, Ashtabula, O.

New England Gas Association.—Annual meeting, third Wednesday in February; Boston. Officers: President, W. H. Snow, Holyoke, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Oklahoma Public Utilities Association.—Annual meeting, May 9, 10 and 11, 1911. Officers: President, E. C. Reynolds; Secretary, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. 20, 21 and 22, 1911, Oakland, Cal. Officers: President, W. B. Cline, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 925 Franklin street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1911, Reading, Pa. Officers President, J. H. Keppelman, Reading, Pa.; Secretary-Treasurer, William H. Merritt Lebanon, Pa.

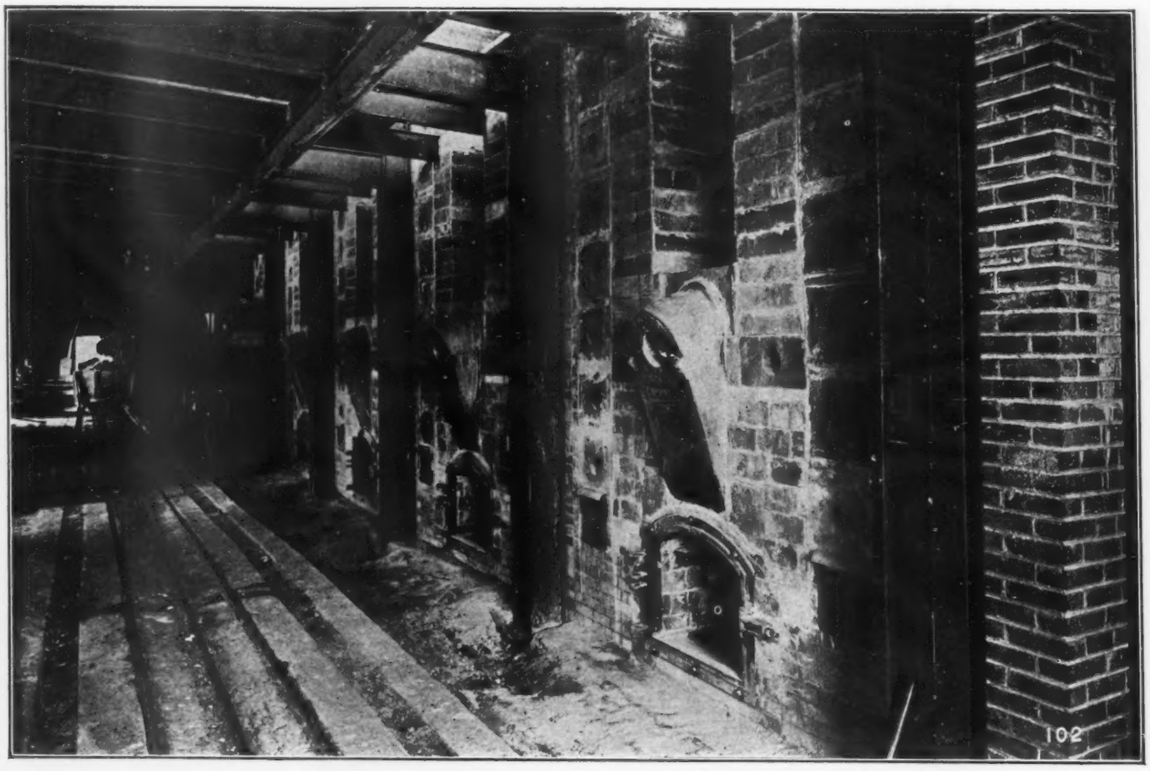
Society of Gas Lighting.—Annual meeting, December, 1910; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 1123 Broadway, New York.

Southern Gas Association.—Annual meeting, April 19-21, 1911, Montgomery, Ala Officers President, H. W. Frund, Salisbury, N. C.; Secretary-Treasurer, Jas. Ferrier, Rome, Ga.

Southwestern Electrical and Gas Association.—Annual meeting, May, 1911, ———— Tex. Officers: President, W. B. Tuttle, San Antonio, Tex.; Secretary, H. B. Head, Stephensville, Tex.

Wisconsin Gas Association.—Annual meeting, May ————, 1911, Milwaukee, Wis Officers: President, W. H. Winslow, Superior, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.

Directory of American Gas Companies, 1910. Price, $5.00. For Sale by A. M. Callender & Co., 42 Pine St., N. Y.



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Profit-sharing implies a mutual interest on the part of both parties.

Our interest lies in giving you the best bench it is possible to build, installing and starting it right, and keeping in touch with its operation afterward, **to see that the best results are maintained.**

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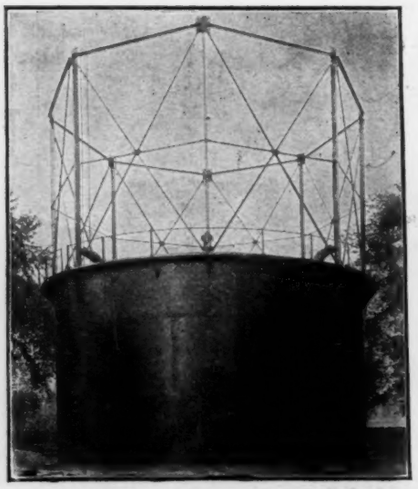

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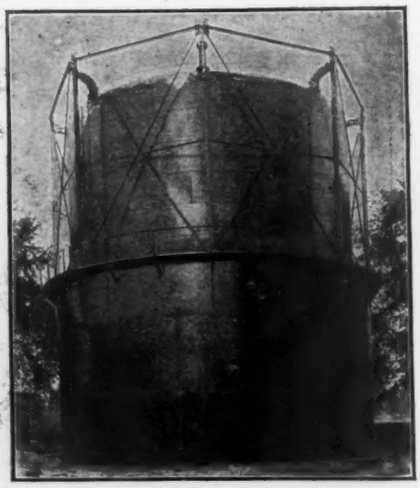

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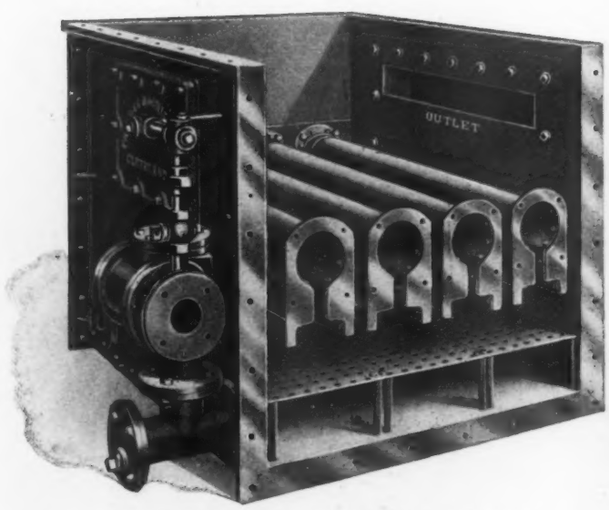

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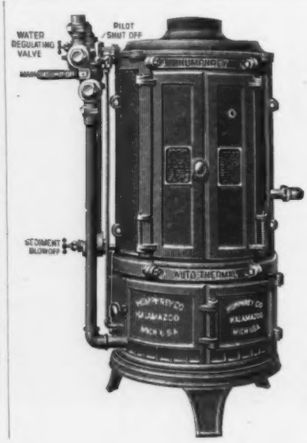

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SIZE - -
KIND - -

OF WORK

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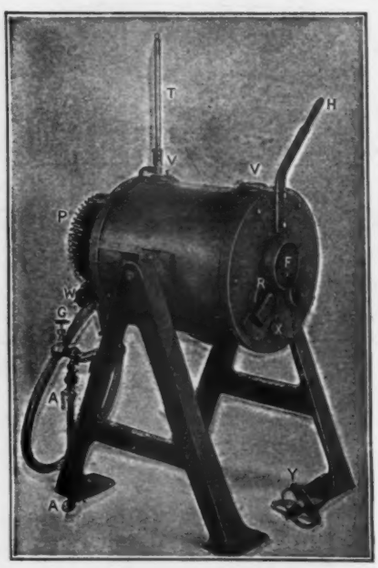

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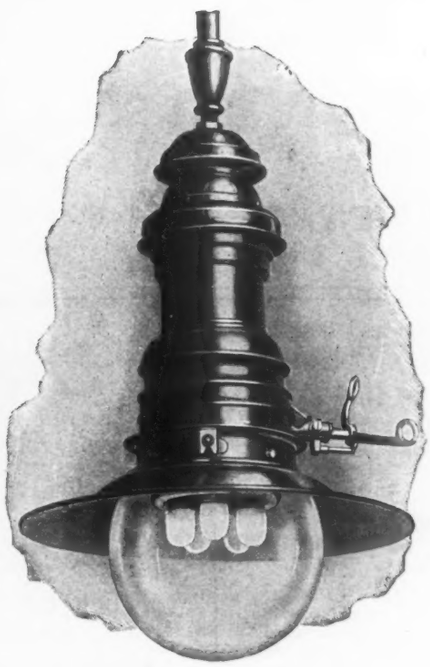

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CRESTON, IA.
DALTON, GA.
DAYTON, O.
DECATUR, ALA.
DELRAY, MICH.
DETROIT, MICH.
GUADALAJARA, MEXICO.
HENDERSON, KY.
HUNTSVILLE, ALA.
IONIA, MICH.
IOWA CITY, IA.
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LOCKPORT, N. Y.
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MILWAUKEE, WIS.
MT. PLEASANT, MICH.
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OWOSSO, MICH.
PARIS, KY.
PARIS, TEX.
PEKIN, ILLS.
PHILADELPHIA, PA.
RICH HILL, MO.
RICHMOND, IND.
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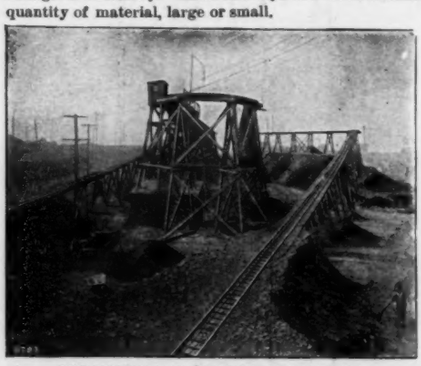

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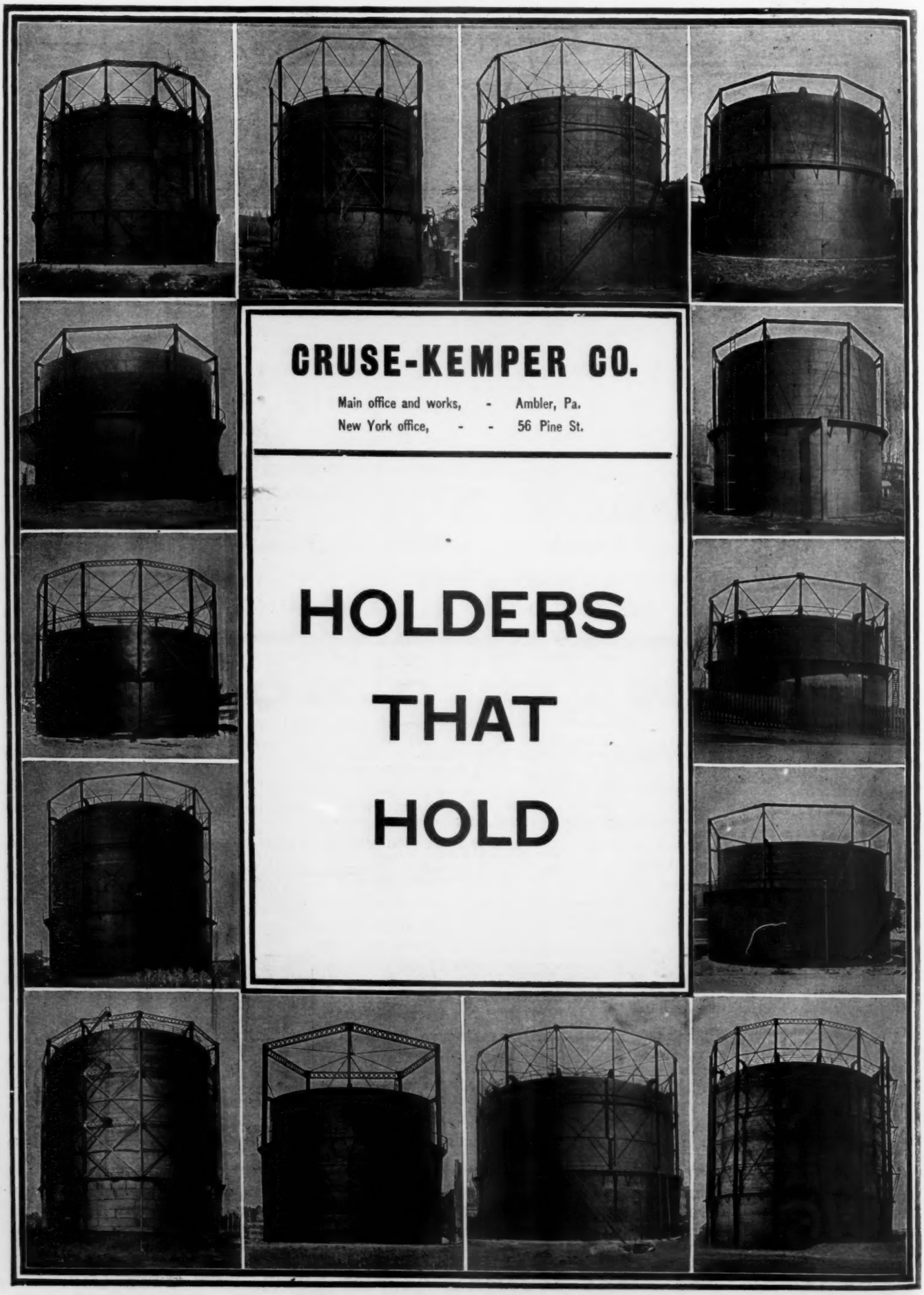
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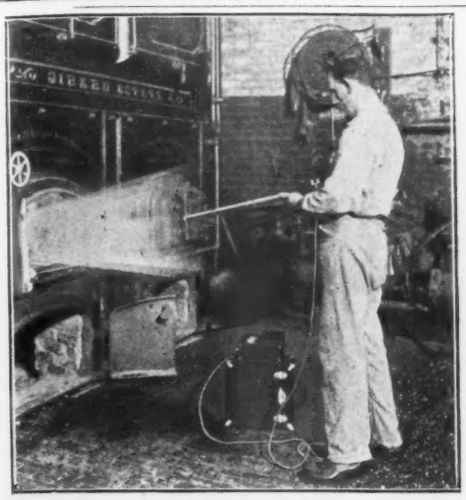

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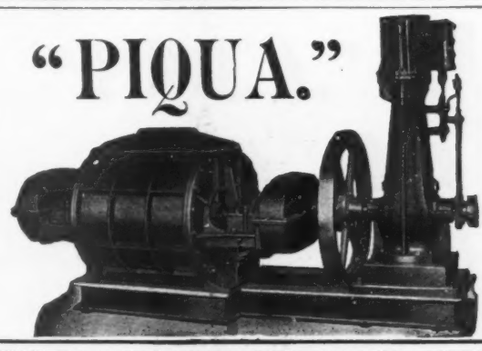

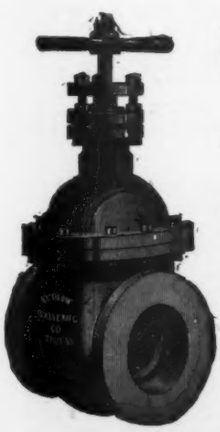

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Day of Week.	Table No. 1. FOLLOWING THE MOON. Date.	Light.	Extinguish.	Day of Week.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Date.	Complete Lighting in 1 Hour.	Complete Extinguishing in 50 Minutes.
						From Time Given.	
		P.M.	A.M.			P.M.	A.M.
Sat.	1	6.20	4.50	Sat.	1	5.22	4.42
Sun.	2	6.10 N.M.	5.00	Sun.	2	5.22	4.42
Mon.	3	6.10	5.00	Mon.	3	5.22	4.42
Tue.	4	6.10	5.00	Tue.	4	5.22	4.42
Wed.	5	6.10	5.00	Wed.	5	5.22	4.42
Thu.	6	6.10	5.00	Thu.	6	5.22	4.42
Fri.	7	6.50	5.00	Fri.	7	5.22	4.42
Sat.	8	7.20	5.00	Sat.	8	5.12	4.52
Sun.	9	8.10	5.10	Sun.	9	5.12	4.52
Mon.	10	9.00	5.10	Mon.	10	5.12	4.52
Tue.	11	9.50 F.Q.	5.10	Tue.	11	5.12	4.52
Wed.	12	11.00	5.10	Wed.	12	5.12	4.52
		A.M.					
Thu.	13	12.10	5.10	Thu.	13	5.07	4.52
Fri.	14	1.20	5.10	Fri.	14	5.07	4.52
Sat.	15	2.30	5.10	Sat.	15	4.57	5.02
Sun.	16	3.50	5.10	Sun.	16	4.57	5.02
Mon.	17	No L.	No L.	Mon.	17	4.57	5.02
Tue.	18	No L. F.M.	No L.	Tue.	18	4.57	5.02
Wed.	19	No L.	No L.	Wed.	19	4.57	5.02
Thu.	20	5.40 P.M.	7.40 P.M.	Thu.	20	4.57	5.02
Fri.	21	5.40	8.30	Fri.	21	4.57	5.02
Sat.	22	5.40	9.20	Sat.	22	4.47	5.07
Sun.	23	5.40	10.20	Sun.	23	4.47	5.07
Mon.	24	5.40 L.Q.	11.30	Mon.	24	4.47	5.07
Tue.	25	5.40	12.40 A.M.	Tue.	25	4.47	5.07
Wed.	26	5.40	1.40	Wed.	26	4.47	5.07
Thu.	27	5.40	2.50	hu.T	27	4.47	5.07
Fri.	28	5.40	3.50	Fri.	28	4.47	5.07
Sat.	29	5.40	5.30	Sat.	29	4.37	5.17
Sun.	30	5.30	5.30	Sun.	30	4.37	5.17
Mon.	31	5.30	5.30	Mon.	31	4.37	5.17

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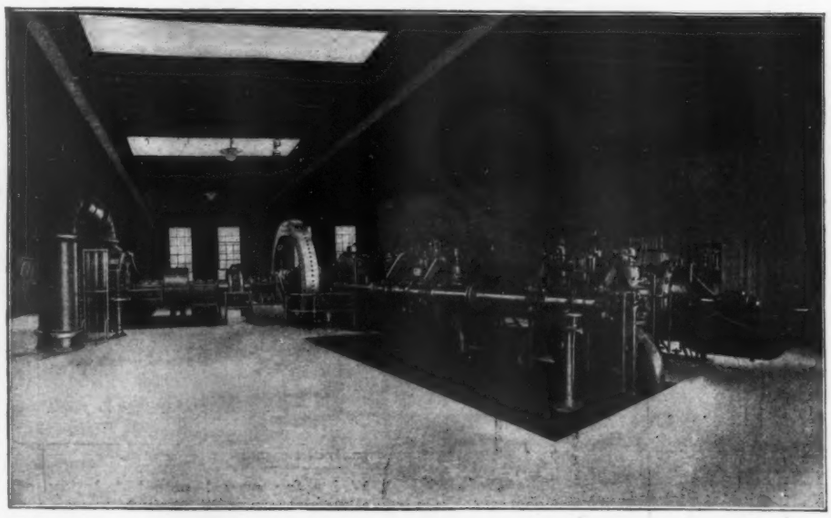

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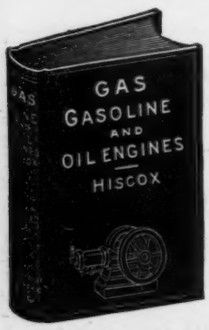

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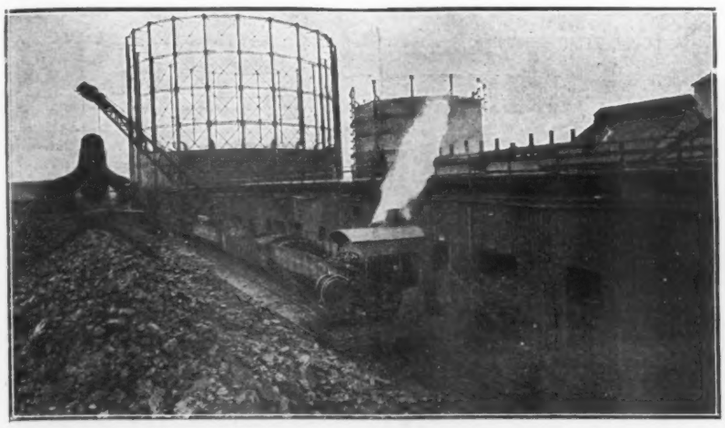

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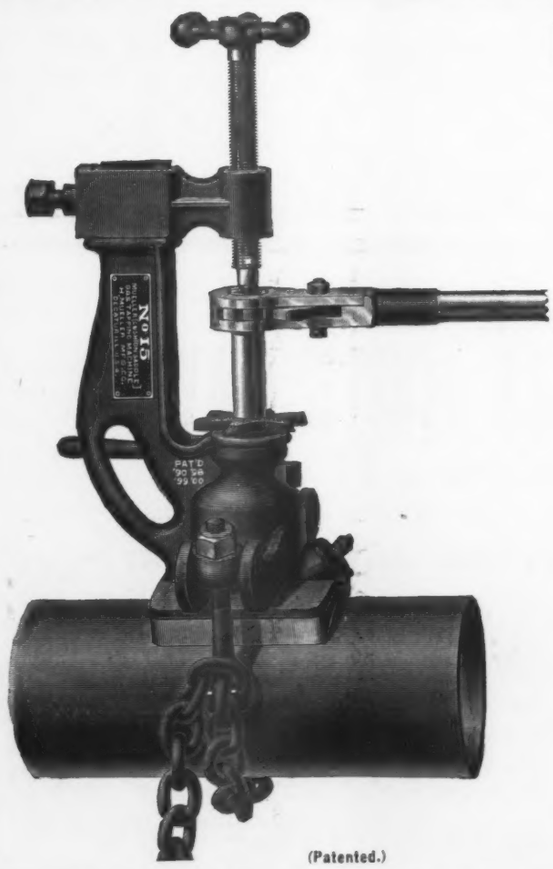

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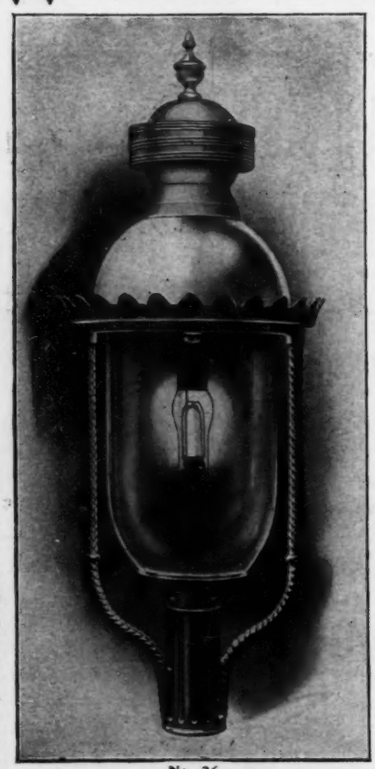

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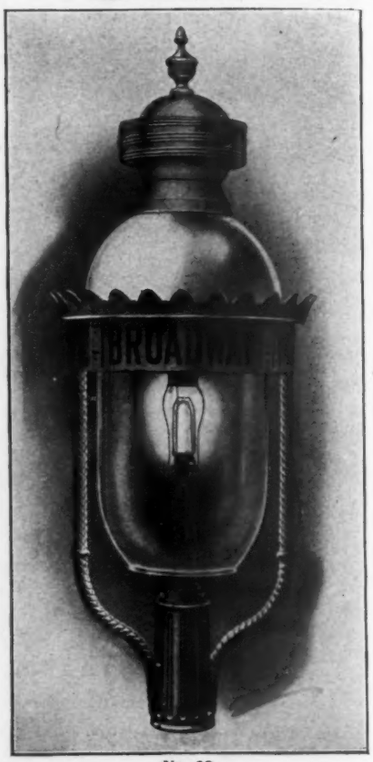

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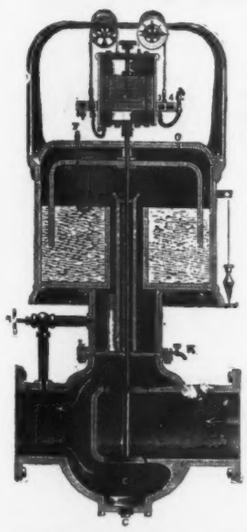

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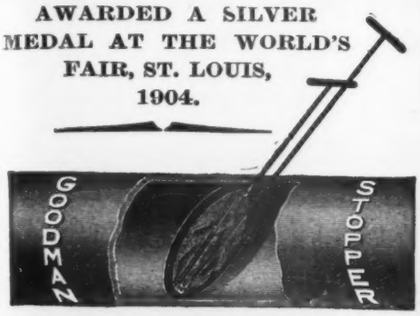

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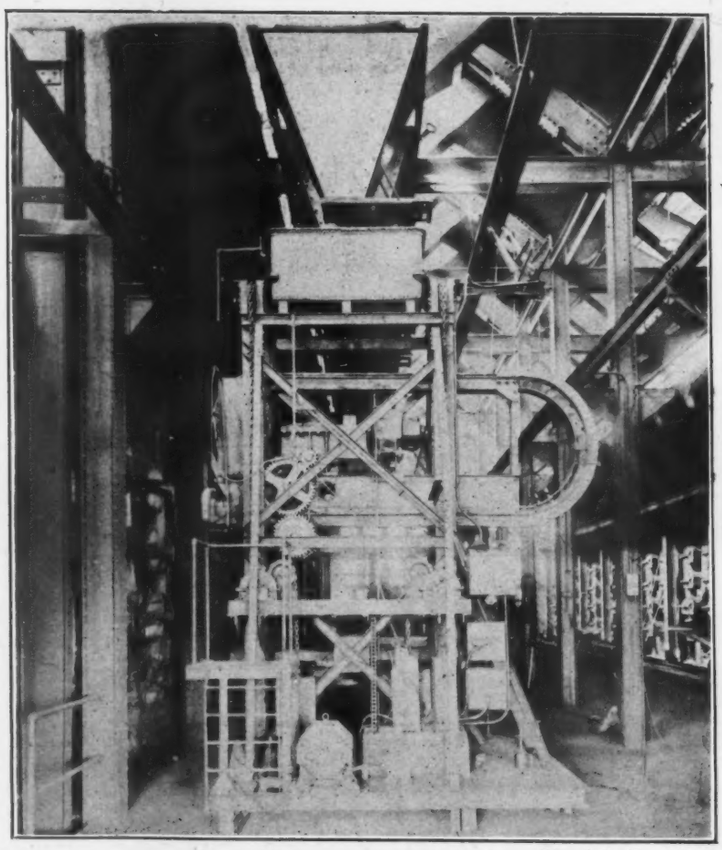

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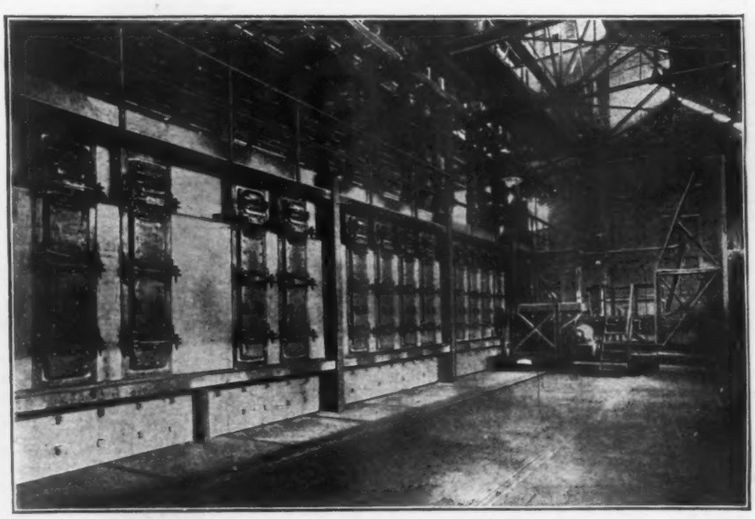

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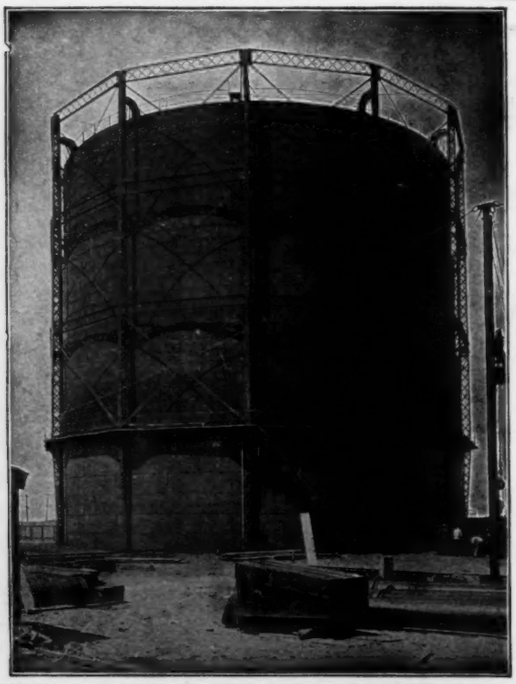

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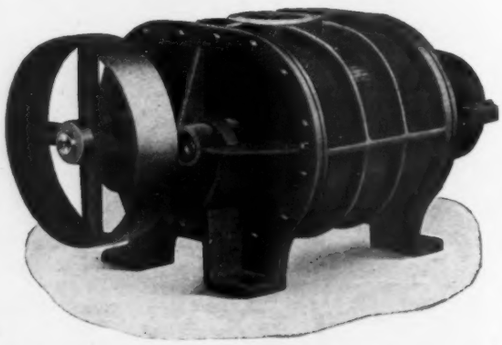

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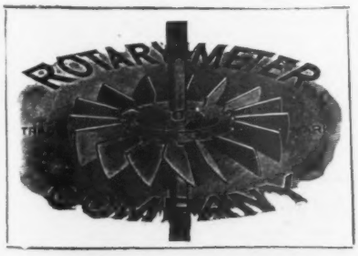

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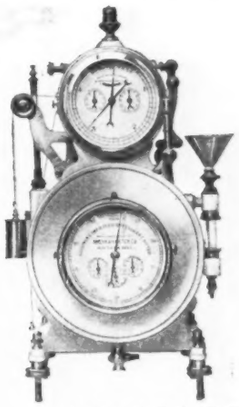

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